



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1 NO. 4

SEPT. 24, 1965

'BB' PLAN UNDERWAY AT KEARNY PLANT

13 WIN MONTHLY CERTIFICATES AT SPACE ELECTRONICS

What does it take to be perfect? The answer to this question could come from any of thirteen Space Electronics Center employees who turned in defect-free work for the month of August.

In recognition of this effort, Certificates of Merit were awarded Sept. 10, during brief ceremonies. Making the presentations, L. M. Limbach, Vice President, Plant Operations, issued praise to Ryan's "perfect 13," expressing his personal "gratification for the splendid effort your perfect work period represents."

Four of the group, all members of Department 895, who are second shift employees and one who is on vacation were not present for the awards ceremony.

Recipients of the special citation are Harry Bell, Ralph Benner, "L" "J" Fann, Fred E. Martin, Walter H. McCracken, Vernon R. Paderewski, Joseph G. Rockstroh, Everett T. Smith, Harlan T. White, Ralph W. Wagenhouser, Orville P. Edmisten, Ivan G. Basel, and Gerard E. Archambault.

One of the winners, Edmisten, has now sustained a 90-day period of error-free work. Wagenhouser, Martin, Paderewski, White and Rockstroh are now past their second consecutive month without an error in their work.

Seventeen Space Electronics Center employees were awarded the Merit Certificate for perfect work during the month of July.

Holders of the "perfect-work" slates agreed that achieving perfection is a task "demanding constant attention to the job at hand."

Without reservation, all chorused their
(Continued on Page 4)



KEARNY employees gave "Ryan Builds Better" a rousing send-off marking start of permanent quality workmanship program.

ERROR-REMOVAL FORM KEY TO "BB" SUCCESS

Proposal Forms are available to all supervisors at Space Electronics and K-M plants for distribution to employees.

Officials this week strongly urged the active interests by supervisors to encourage employee participation in the proposal program.

"This is one of the truly concrete methods of attaining quality-workmanship," J. D. Ryan noted.

"In most instances, the average employee can find at least one area in his work environment that could be improved. They owe it to themselves to submit their recommendations."

EFFORT BY ALL URGED AS PLAN LAUNCHED AT K-M

A throng of some 550 Kearny Mesa plant employees officially launched their "Ryan Builds Better" program last Thursday morning under sparkling San Diego skies and to the throbbing tempo of Dixieland music.

The kick-off rally, attended by all K-M employees, supervisors and key Company officials, marked the two-thirds point in Ryan Aeronautical Company's goal of implementing the quality-workmanship plan at all facilities.

Patterned after the now-famous "Zero-Defects" program of the Air Force and key aerospace industries, the "Ryan Builds Better" plan was initially introduced last June at the Space Electronics Center.

Kearny Mesa's rally left only the downtown San Diego plant and field service units to go before the long range goal is achieved.

Fred Finn's popular "Mickie Finn's"
(Continued on Page 2)

AT-A-GLANCE WITH

J. D. Ryan

DIXIELAND TEMPO SETS PACE FOR KEARNY-MESA KICKOFF

The message was fairly well presented last Thursday by men imminently qualified to speak on the subject of company-wide programs such as our "Ryan Builds Better" plan.

And, aside from the philosophic aspects related to pride in one's work, it was made crystal-clear to me that we're all striving for pretty much the same goals today.

Each of us want job security; we also want recognition for our individual accomplishments; and we should realize that it is only through self-disciplined efforts that these goals can be realized.

It might be pointed out that one of the real keys to success we hope to achieve lies in establishing goals for yourself, your department or shop and those the company will set for the long haul on a company-wide basis.



JERRY RYAN

These goals must be based on realistic foundations and within reasonable

proportions, of course.

So let's size up our "Builds Better Program" at the outset like this:

View the overall program as a vehicle by which the various self-disciplines can be developed. And the subsequent goals realized.

Admittedly, this may be an over-simplification. But the average person can grasp the significance of the program if he views it this way.

Above and beyond all else, my position in the "Ryan Builds Better" program is to direct your collective and individual efforts in pursuit of the overall goals. I'll need your help, your suggestions and generous cooperation.

It's a rather hackneyed line nowadays, but it gets the point across: If you haven't tried it . . . don't knock it!

The "Ryan Builds Better" program does not harass people for poor performance. It extends them public recognition for outstanding performance, following the objective goals of the total effort.

(Continued from Page 1)

combo helped set the mood as employees turned out for the free refreshments and to listen to brief talks by Ryan, Air Force and Douglas Missile and Space Systems officials.

Speakers included T. Claude Ryan, Chairman of the Board; L. M. Limbach, Vice President, Plant Operations, who doubled as Master-of-Ceremonies; Lt. Colonel H. C. Mann, U.S. Air Force Liaison Officer at K-M; and Hubert M. Childress, Assistant to the Vice President and General Manager at Douglas Missile and Space Systems Division.

Acknowledging the "gratifying" results achieved by the Space Electronics Center since its introduction of the "BB" program, the Company's founder emphasized the growing need for increased quality-reliability in the aerospace industry.

Calling it a "symbol of our acceptance of Zero-Defects work standards, Mr. Ryan presented a "Ryan Builds Better" pennant to Bob Schwanhauser, Director of Drones and Special Projects, to get the program under way.

The red and white pennant is displayed daily immediately below the American flag and now flies at both the Space Electronics Center and the K-M plant.

Colonel Mann underscored the economic and reliability goals achieved through the past two years of "Zero-Defects" programs within the Air Force.

He said these same values "are available to all of the industries working in the aerospace field today. It is up to the individual employee to actively pursue these values through," he added, urging active support and cooperation of his audience.

As principal speaker, Childress traced the progress of Douglas' "Value In Performance" program over the past two years, comparing its early beginning and the attitude "problem areas" that could be anticipated here.

Once again, the emphasis was placed on "individual employees," as the message appealing for "acceptance and active support" was issued by Childress.

"Individual job security, long-range work programs, self-improvement are only a few of the values this program offers," he added, commenting that the "Ryan

Builds Better" program will succeed "only while it has your active participation."

Limbach's closing remarks summarized points that had been underscored by the speakers.

"How we stay together at Ryan, our progress and advance as a leading aerospace company in this highly competitive business, and your position in this company, rests squarely on your shoulders," he stated.

Jerry D. Ryan, assistant to Limbach and coordinator for the Company-wide program, said the quality-workmanship plan would be implemented at the main San Diego plant in the very near future.

A series of supervisor meetings are being scheduled as a "buildup" to the implementation of the program in the main plant. "Ryan Builds Better" literature will be distributed to all supervisors for study to determine how the plan can best be utilized in their respective areas of work.

Meanwhile, steps are being taken to introduce elements within the program at Ryan field service bases, as appropriate to the numbers of men assigned at these facilities and the nature of work in which they are engaged.

Ryan's field service unit at Tyndall Air Force Base has already implemented applicable elements of the "BB" program in conjunction with its Firebee buildup program supporting William Tell '65.

Under the direction of Base Manager Bert Hale, Jr., the buildup program has included stringent, new inspection standards introduced through the Air Force's "Zero-Defects" concept at Tyndall.

ITS UP TO YOU!

The "Ryan Builds Better" program places responsibility for performance squarely on the shoulders of the individual . . . not on supervisors, not on inspectors and not on watchdogs of management. It brings back something that has long been missing from the American industrial scene: Craftsmanship!

It is a program of people, one whose values have been repeatedly demonstrated in the weeks since June of this year.

PICTURES TELL STORY OF KEARNY-MESA KICKOFF



K-M's Bob Schwanhauser and T. Claude Ryan display "Ryan Builds Better" pennant.



KEYNOTE SPEAKER, Hubert Childress, told of progress achieved through Zero-Defect type program at Douglas under his guidance.



AUDIENCE heard T. Claude Ryan express importance of program and set goals in future.



RYAN'S "BUILDS BETTER" employees have pledged support of program.



MICKIE FINN combo mixed ragtime-Dixieland tempo to open outdoor rally, marking start of K-M's "Ryan Builds Better Program."



ACCEPTANCE OF program at K-M marked two-thirds point in expansion of plan to all Ryan facilities.

CERTIFICATES AWARDED

(Continued from Page 1)

approval of the "Ryan Builds Better" program.

"It is restoring individual pride in our work, an element that has been missing for too many years now."

A 100-percent improvement in a system formerly used in cleaning components at Space Electronics Center has been achieved as a result of the Error Cause Elimination Proposal system, an adjunct to the "Ryan Builds Better" program.

Sherman E. Linen, an electronics assembler turned in the proposal to devise an alcohol spray gun for cleaning dirt and flux from components.

His recommendation gained immediate recognition and evaluation of John Powell, foreman for Space Assembly Shop and is now in use.

A second proposal by Linen related to wire cutters that toss loose wire ends into the air and land in equipment or on the floor, creating unnecessary hazards.

Future purchases of wire cutters will include a rubber sealant on the cutting edges of the wire cutter blades.

A 60 percent time savings through the use of 25-foot lengths of tin soldering wire instead of short, two-inch sections, will result from the proposal of Matthew F. Focht, also of the Assembly shop.

His proposed improvement also gives a smoother soldering finish to the joining procedure.

The "Ryan Builds Better" program does not penalize workers for making mistakes; rather, it praises them for doing a job properly.



RYAN "PERFECTIONISTS" proudly display Certificates of Merit won for error-free work during August. Awards were made by L. M. Limbach (center) and were witnessed by Dick Wells (2nd from left) Plant Superintendent, and Ray Fredsti, (5th from right), Quality Assurance Manager.

FIRST 90 DAYS PROVE VALUES OF "BB" PROGRAM

Approaching its first three months of existence at Space Electronics Center, and as the "Ryan Builds Better" program got underway at the K-M plant, officials this week turned to statistics for basic evaluations of its application.

At the very top of the list is a 34-percent reduction of Material Review actions during the three-month period just ending!

"This means a significant savings in man-hours alone. And without exploring further, we are encouraged to believe that the primary contributor to this savings is the spirit being generated toward the program," said Chuck Henry, Quality Assurance Chief at Space Electronics Center.

He noted that 400 work operations

within the past 30 days had been completed without any form of error, another reflection of Zero-Defects philosophy.

Less tangible, according to Henry, is the "remarkable attitude change on the part of employees toward the work we're engaged in today.

"Numerous employees, in discussing the program with me, have expressed their delight in the return of quality-workmanship to the work environment.

Summing up, Henry traced the initial three-month period of advance toward complete error-free work, emphasizing that "we still have a long haul ahead.

"But, through our 'Ryan Builds Better' program we know we're on the right track!"



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY
P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 6

RYAN AERONAUTICAL COMPANY

APRIL 29, 1966

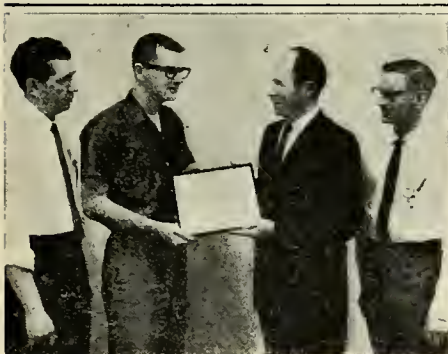
FIRST ANNIVERSARY OF 'BB' PLAN MARKED BY NOTABLE PROGRESS

Electronic Testing Team Wins Special Award



500-MAN-HOUR ERROR-FREE WORK PERIOD earned for this testing team at Electronic and Space Systems Facility the first special "Builds Better" group award at that plant. Under supervision of William J. Vecera, test supervisor, second from right, team tested components and sub assemblies used in Lunar Excursion Module (LEM) Landing Radar System. Framed certificates were presented by Charles J. Badewitz, Chief Engineer, Electronic and Space Systems, third from left, to left to right, Bob Faught, Don Gardner, Al Ballard, Sam Bradsher, Joe Craig, and Wally Underwood.

(SEE STORY, PAGE 2)



FIRST "BUILDS BETTER" INDIVIDUAL AWARD in electronics engineering was presented this month to Jack Simmons, second from left, design draftsman, by left to right, Jack Drake, Group Engineer, LEM Drafting; Charles J. Badewitz, Chief Engineer, Electronic and Space Systems Facility; and Harry Frankland, Design Specialist.

(SEE STORY, PAGE 2)

Errors Reduced Substantially In All Three Plants

The "Ryan Builds Better" program approaches its first anniversary next month with a notable record of accomplishment.

Since the quality workmanship plan was launched at the Electronic and Space Systems Facility plant May 24, 1965 — and later expanded to the Kearny Mesa and San Diego plants, and to Ryan Field Service bases, great progress has been made toward achieving the "Zero Defects" objective, according to a report by J. D. Ryan, Coordinator of the "Builds Better" program.

"Errors have been reduced substantially in all plants, and our customers are pleased with the results in all airframe, electronics and aerospace projects," he said.

"There has been a noticeable effect on the spirit and attitude of employees as they strive to maintain quality workmanship at a zero defects level. Pride of craftsmanship is one of the great motivating forces in this entire program, and the collective results are not only improving Ryan products while meeting delivery schedules, but are materially assisting the nation's defense effort."

The "Builds Better" program was inaugurated at the Electronic and Space Systems Facility following a memorable Open House attended by nearly 2,000 Ryanites, their families, friends and spe-

(Continued on Page 3)

In Error-Free Spotlight



STAR PERFORMERS at Kearny Mesa plant for three consecutive months comprising first quarter of 1966 were employees in electrical harness assembly, who attained top "Zero Defects" record with best combination of error rate improvement and sustained low error level. Thecla "Cookie" Hoover and Reba Street, left to right, electronic assemblers, represented department in presentation of banner and plaque by A. C. "Tony" Richards, at left, and Robert H. Guyer. Three "rungs" on "ladder" beneath plaque indicate each monthly award. Since photo was taken, Richards has been promoted from Assistant Superintendent to Superintendent, Kearny Mesa, and Guyer, former Manufacturing Manager, Electronics and Kearny Mesa plants, has been named Manufacturing Manager, Electronic and Space Systems.



ERROR-FREE PERFORMANCES at Edwards Air Force Base by Ryan field crew master mechanics Thurman Middleton, above, and Glen A. Brotherton, below, were honored recently in presentation of monthly "Ryan Builds Better" certificates by, left to right above, T. M. Miller, maintenance supervisor; W. A. "Bud" Meixner, operations and maintenance superintendent; and John H. Burhans, Ryan test base manager; and left to right below, Burhans, Miller and Meixner. Ryanites support flight test program of XV-5A V/STOL Army aircraft.



FIRST SPECIAL AWARDS PRESENTED IN 'BUILDS BETTER' PROGRAM

(See Photo, Page 1)

An outstanding performance that attained the peak objectives of the "Ryan Builds Better" program has earned for six technicians at the Electronic and Space Systems facility the first special award granted to a group representing a total effort since the "BB" plan went into effect last year.

Working night and day for nearly three months, this team tested components and sub assemblies for the Lunar Excursion Module (LEM) Landing Radar System designed and built by Ryan, compiling more than 500 man-hours with no failures or defects.

Special award certificates have been presented to Sam Bradsher, Wally Underwood, Bob Faught, Al Ballard, Joe Craig and Don Gardner. Their error-free work helped make possible the recent on-schedule delivery of the first flight configuration model of the system shipped to Grumman Aircraft Engineering Corp., Bethpage, Long Island, N.Y., Apollo prime contractor, for spacecraft integration testing.

As result of their accomplishment, 150 component assemblies, or "cordwoods," were approved for final assembly into the LEM radar system. Each of the "cordwoods" and sub assemblies are micro-miniaturized, and had to be handled and tested with extreme care.

One test failure, or one item damaged in handling, would have cost Ryan thousands of dollars and precious days lost in a tight schedule.

Under supervision of William J. Vecera, test supervisor, the test team not only had to accomplish the "round the clock" test program, but had to construct the "breadboard" sets with which the tests were made.

Design verification results of the testing permitted engineers to go directly from "breadboard" prototype to the production article, an unusual feat.

EMPLOYEES ENCOURAGED TO INITIATE PROPOSALS

An important feature of the "Ryan Builds Better" program is being gradually expanded in all three plants.

Employees are encouraged to initiate error-cause elimination proposals to put the spotlight on plant activities they believe can be improved with a view toward

(Continued on Page 4)

(See Photo, Page 1)

The first special individual award of its kind within electronics engineering in the "Ryan Builds Better" program has been won by a design draftsman at the Electronic and Space Systems Facility.

He is Jack Simmons, who was responsible for layouts of all tracker subassemblies in the electronics assembly of the Ryan Landing Radar System for the Lunar Excursion Module (LEM), in which two Apollo astronauts will make a soft landing on the moon's surface.

Working as much as 58 hours a week in order to meet the critical delivery schedule, Simmons attained the objective of the "Builds Better" program with an error-free performance.

A Ryanite since February, 1956 — with time out for military service — Simmons is carrying a substantial academic load in addition to his Ryan job. He has returned to school, and is taking an engineering course at San Diego City College during the morning hours. To accommodate his schooling, he works on a special shift beginning in early afternoon.

Simmons was honored this month by presentation of a framed "Ryan Builds Better" certificate with special citation.

Symbol Of 'BB' Program



"BUILDS BETTER" PENNANT, which flies with national colors, is displayed by T. Claude Ryan, Board Chairman, and J. R. Iverson, Director, Electronic and Space Systems.

RYANITES UNITE BEHIND 'BB' DRIVE



SYMBOLIC OF UNITY of Electronic and Space Systems Facility employees, representatives of various departments stride arm in arm before banner proclaiming start of "Zero Defects" program last May.



KEARNY MESA PLANT KICKOFF RALLY last September ignited enthusiasm for "Builds Better" program among employees.

Notable Progress Marks First Year Of 'BB' Program

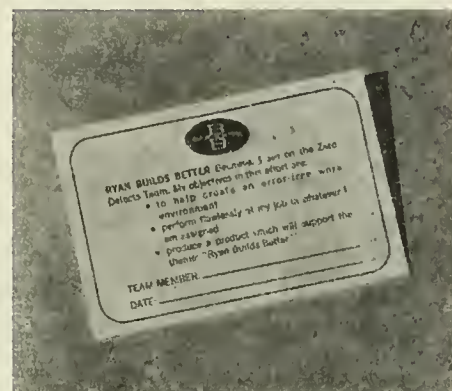
(Continued from Page 1)

cial guests. The theme emphasized a call by the Department of Defense to all key industries to institute techniques aimed at eliminating work errors and reducing manufacturing costs and time.

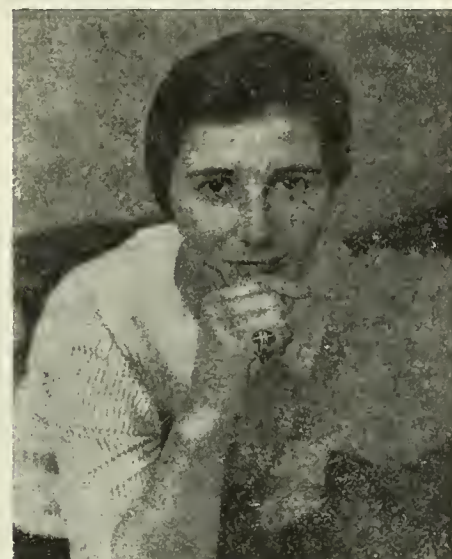
The "Ryan Builds Better" slogan, stemming from a long-standing company tradition, was given new meaning and impact

as a competitive system was established, and spread throughout the three plants and to the Field Service bases.

Group and individual awards (see elsewhere in this Bulletin) have been presented to dozens of employees and departments for distinctive achievements in elimination of errors. Trophies, plaques and banners are material symbols of



PLEDGE CARD binds Ryanites to team effort to help create error-free work environment.



INGENUITY of Susan Files, secretary to Charles J. Badewitz, Chief Engineer, Electronic and Space Systems, converted Ryan "Builds Better" lapel pin to an attractive finger ornament by having it soldered to a ring.

work excellence, and performance improvement charts are tangible reminders of the goals being sought. Pledge cards signed by all employees bind them to a team effort to help create an error-free work environment.

"The space effort is rapidly approaching its most critical point," Ray Fredsti, Quality Assurance Manager and Coordinator of the "Builds Better" team at the Electronic and Space Systems Facility, said when the program was implemented there. "Competition is at an all-time high and products are growing more complex and sophisticated. At Ryan we believe the human element in this vast effort is still the most important facet in success. Through our 'Ryan Builds Better' program, we're out to prove this belief."



FEATURING KICKOFF RALLY in main plant last November were "Ryan Builds Better" hostesses, company officials and active and retired Navy officers. Employees pictured below, were, addressed in bandstand area by, left to right, J. D. Ryan, Coordinator of the "Builds Better" Program; Raymond Ortiz, Works Manager; Rear Adm. Paul A. Holmberg, Fleet Readiness Officer for the Navy Bureau of Weapons in San Diego; T. Claude Ryan, Company Board Chairman and Chief Executive Officer; and Vice Adm. Paul D. Stroop, USN ret., a Ryanite who formerly was Commander of the Naval Air Force, Pacific Fleet.



ERROR-FREE WORK GOAL LEADS TO DRAMATIC RESULTS

Dramatic examples of the results that can be achieved through emphasis on reduction and ultimate elimination of defects in workmanship have been provided in recent weeks in the space program at Ryan.

Within a brief period, deliveries were accomplished, either exactly on time, or ahead of schedule of two electronic systems vital to the projects that will eventually place an American on the moon.

The first flight configuration model of the Landing Radar System for the Lunar Excursion Module (LEM) to be used in soft-landing Apollo astronauts on the lunar surface was completed exactly on schedule.

This required coordination of the efforts of more than 320 Electronic and Space Systems Facility design, engineering, production and other support personnel whose race against time would have been defeated by time-consuming errors. Included in this team were the technicians whose testing of components and sub assemblies earned them a special award in the "Ryan Builds Better" program (see Page 2 of this Bulletin).

Another outstanding achievement was the delivery, six days ahead of schedule, of Ryan's fourth assured flight model of the radar altimeter and Doppler velocity system designed for use in the Surveyor spacecraft. Objective of the Surveyor project is to soft-land an unmanned space vehicle on the moon for explorations preliminary to the Apollo manned mission.

Ninety Electronic and Space Facility engineering, technical, assembly, production and support personnel are engaged in this program.

EMPLOYEES ENCOURAGED TO INITIATE PROPOSALS

(Continued from Page 2)

reducing or eliminating defects.

Supervisory personnel will have available forms on which such suggestions can be outlined. Each proposal will be carefully screened and analyzed by supervisors, assisted by an outside support group. If the suggestion is deemed practical, it will be put into effect, and as with other "Ryan Builds Better" awards, special recognition will be given employees for outstanding proposals.

RYAN AERONAUTICAL COMPANY
P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



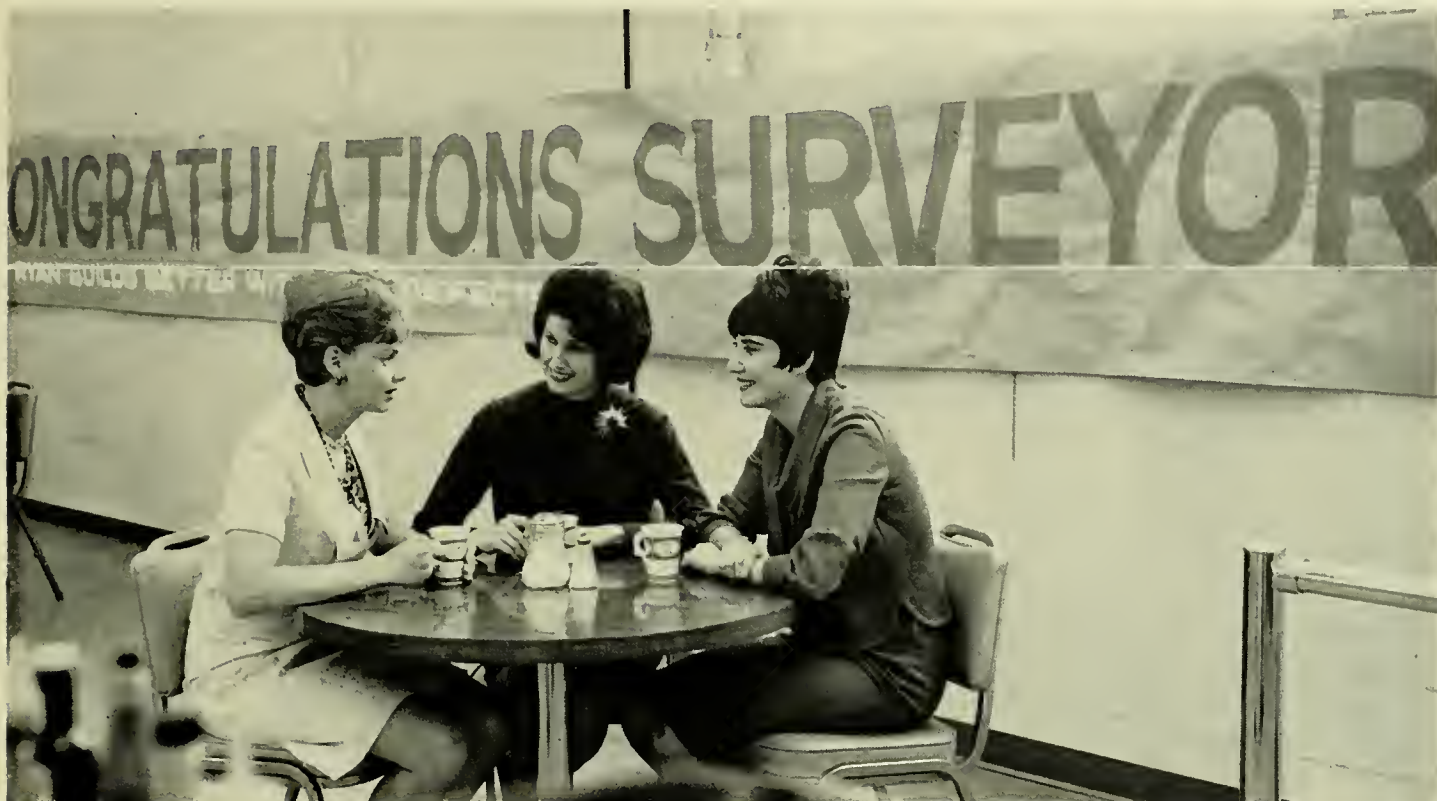
BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 7

RYAN AERONAUTICAL COMPANY

JUNE 17, 1966



BECAUSE "RYAN BUILDS BETTER WITH ZERO DEFECTS," Surveyor soft landing on the moon was success on its first attempt, huge sign in Electronic and Space Systems plant cafeteria reminds Ryanites. Employees are, left to right; Jeannette Thompson, secretary to J. J. Bowden, Manager, Advanced Systems; Marsi Michael, secretary to Bruce Clapp, Surveyor program manager; and Bev Diamond, clerk in the Requirements section of Electronic and Space Systems Marketing.



SURPRISE rose bouquet was presented Virginia Ocello, representing Electronic and Space Systems employees, at "victory" celebration after Surveyor lunar landing. Frank Gard Jameson, Vice President, Programs, lauded Ryanites for perfect performance of spacecraft's radar, then called on Virginia, assistant foreman, Surveyor "clean room," to receive flowers as T. Claude Ryan, Board Chairman, offered congratulations.

"Zero Defects" Pays Off In Radar Perfect Performance On Surveyor

The Ryan "Builds Better" program, with its emphasis on error-free workmanship, produced its biggest payoff this month with perfect performance of the Radar Altimeter and Velocity Sensor System on the Surveyor spacecraft that made the first soft landing by an American vehicle on the moon.

Failure had to be avoided in every unit of the complex electronic system that controlled the descent of Surveyor as it was decelerated from 6,000 mph to the landing speed at which a human parachutist hits the ground.

Shortly after the two radar antennas were activated at approximately 30,000

feet above the moon, to detect altitude and velocity in radar return signals, the Surveyor was wholly dependent on the Ryan electronic gear for information on how fast the spacecraft was approaching the moon.

Signals from the system controlled the throttle valves on the vernier rocket retro-thrust engines which slowed down the vehicle and guided it to a gentle landing on its spider-like legs. At exactly 14 feet above the surface, the Ryan radar signalled the engines to shut down, permitting a free fall that enabled Surveyor to land without digging a crater or covering

(Continued on page 2)

RYAN RELIABILITY LAUDED BY FLEET TRAINING CHIEF

Reliability is the name of the game in the Space Age, according to the Pacific Fleet's top training officer.

Rear Adm. David Lambert, Commander, Training Command, Pacific Fleet, told the Ryan Management Club at its recent monthly meeting that the "Builds Better" program has established for Ryan a reputation for product excellence.

The staggering complexity of electronic systems in spacecraft makes imperative the establishment of "Zero Defects" standards, he declared.

"It has been noted," Adm. Lambert said, "that the electronic system of a typical missile has 36,000 to 37,000 separate items which must function properly if the missile's flight is to be successful.

"If each item is so reliable that it would fail only once in 100,000 times, the mathematical chances are that one missile in three would be a misfire. The requirement of 'zero defects' is obvious."

The officer lauded Ryan for its quick response to unforeseen defense requirements, and cited as a prime example the swift development of a reliable remote-controlled surface target following the Tonkin Gulf incident in 1964, when U.S. warships were attacked by PT-type enemy vessels.

The resultant 17-foot Ryan Firefish has provided the target for gunnery training that has increased the Navy's capability, not only against moving seaborne targets in Southeast Asia, but also against shore targets, Adm. Lambert said.

He also praised Ryan's 17-year record of building Firebee aerial target drones for the Navy, and called attention to the remarkable condition of a Firebee drone recovered in the Pacific recently more than 2 years after it disappeared during a target mission, as evidence of the watertight integrity that results from high levels of reliability.

Radar Performs Perfectly

(Continued from Page 1)

itself with lunar dust, as might have occurred if the engines continued to fire.

Remarkable performance of the Ryan system won congratulations from officials of the National Aeronautics and Space Administration, Hughes Aircraft Co., prime contractor, and others associated with the program.

Ryan Role In Surveyor Success Draws Tribute From Company Head

Spectacular success of the Surveyor soft-landing on the moon, made possible by perfect functioning of the Ryan Radar Altimeter and Velocity Sensor in coordination with all other systems on the spacecraft, evoked the following tribute from T. Claude Ryan, company Chief Executive Officer and Board Chairman:

"The success of this first engineering flight of the Surveyor spacecraft is a tribute to the tireless efforts of the NASA-industry team. Ryan, as a member of that team, designed, developed and proved flightworthy the landing radar system that controlled the Surveyor spacecraft during the critical final moments before moon landing.

"Our task was to design, build and test the lunar landing radar system for the spacecraft, then after proving it flightworthy, integrate it with other electronic systems. It was a demanding task. Designing the system pushed us into previously uncharted engineering areas. Creating a lunar environment in our test laboratories in which to prove the system was equally demanding. Our efforts have been rewarded.

"The final moments of the flight appeared to be no less than perfect. Spacecraft attitude was right, and our system controlled the vernier retro-thrust engines with the precision expected. The engines were cut off at the right fraction of a second, and the spacecraft landed at the design speed.

"I know I speak for all San Diegans in extending congratulations to all members of the Surveyor team. I extend special congratulations to our talented Ryan Electronic and Space Systems engineers under the leadership of Dick Iverson, our Electronic and Space Systems Director. They have invested great individual effort and dedicated spirit to this program.

"As we look forward to future flights of Surveyor, I feel very proud of our effort, and of the nation's space effort."

T. Claude Ryan

BULLETINS EMPHASIZE QUALITY PERFECTION

To insure reliability and quality perfection in the Materials and Process Laboratories participation in the LEM (Lunar Excursion Module) program, A. F. Hofstatter, Laboratories Manager, has begun the issuance of a series of bulletins.

The notices will call attention to critical handling and processing requirements, and will serve as a constant reminder to employees of the project's specifications.

First of the series pointed out that brazed magnesium assemblies must be DOW 19-coated in the ultrasonic tank at the San Diego plant, and warned against stripping DOW 19 from close tolerance parts without proper approval, since stripping and recoating with this chromate chemical conversion coating will cause some metal loss.

'Builds Better' Earring



NEW LOCATION for Ryan "Builds Better" pin was conceived by Lillian A. Kenniston, multilith operator, Department 327, Reproduction. She converted a lapel ornament into an earring, with the result pictured above.

First Monthly Awards Presented At Electronics Plant



FIRST MONTHLY "BUILDS BETTER" DEPARTMENT AWARD at Ryan Electronic and Space Systems was presented recently to employees in Department 896, Electronic Test Equipment Assembly, for their outstanding performance in maintaining high level of "Zero Defects" quality workmanship. Department builds equipment to test assemblies for the Surveyor and LEM (Lunar Excursion Module), and other research and development projects.

Left to right, above, day shift employees with Robert H. Guyer, Manufacturing Manager, center—standing, R. G. Wells, Manufacturing Superintendent; A. George, B. Jackson, George Felix, day shift foreman; L. Hunt, R. Jamieson, M. Rustad, V. Howell, H. Norris, M. P. Kissinger, Director, Quality Assurance; S. Carr, E. Connely, M. Williams, M. Ascencio, G. Ridley, C. Benner, J. Eade, M. J. Kincaid, and Ray Fredsti, Manager, Quality Assurance, Electronic and Space Systems. Kneeling, J. Prickett, L. Ammon, C. Badger, F. Deese, D. Singh, C. Evans, B. Derrick, B. Donovan, L. Hansen, L. Tucker, L. Wise, G. Goold.

Night shift employees, in photo below, left to right standing, George Felix, H. Gaus, H. Garrison, E. Gilpin, R. G. Wells, D. Bennett, A. Hise, and Jim Haag, night shift foreman. Kneeling, W. L. Johnson, K. A. Wheeler, Bob Harp, Leo Imbimbo.

Department received Monthly Craftsmanship Award banner and plaque.



INDIVIDUAL HONORS WON BY EMPLOYEES FOR NEW IDEAS

Special awards for performance "beyond the normal call of duty" have been won by two Ryan Electronic and Space Systems employees for outstanding achievements in the "Builds Better" program.

Mrs. Belia C. Morales, a solder assembly operator, and R. C. Ross, an electronic component preparator, earned the first such honors ever given at the facility.

Mrs. Morales suggested making a LEM (Lunar Excursion Module) cordwood fixture to identify the top and bottom sides of the cordwood. This fixture has been used in LEM cordwood sub assembly for several weeks, and has been highly successful in eliminating the construction of cordwoods with reversed printed-circuit boards.

Ross designed and built a three-leg tweezer, replacing the two-leg type used in heat-sinking high reliability components. This prototype tool was successfully tested on both work shifts and has proven to be both simple and practical in insuring reliable and high quality tinning.

Mrs. Morales and Ross were presented certificates of appreciation by Robert H. Guyer, Manufacturing Manager, and R. G. Wells, Manufacturing Superintendent, of Ryan Electronic and Space Systems.

The certificates express "grateful acknowledgement of the demonstrated efforts" of the two employees in support of the Ryan "Builds Better" Zero Defects program. Such awards will be made to individuals, as merited, on a special recognition basis.



FIRST SPECIAL INDIVIDUAL AWARD CERTIFICATES for major contributions to the "Builds Better" program at the Electronic and Space Systems facility were presented recently to Mrs. Belia C. Morales and R. C. Ross by R. G. Wells, Manufacturing Superintendent, at left, and Robert H. Guyer, Manufacturing Manager, at right.

'BUILDS BETTER' TRADITION TRACED BACK 40 YEARS

Ryan's "Builds Better" tradition can be traced back nearly 40 years, to the 60 hectic days in 1927 when a small group of dedicated employees built Charles Lindbergh's "Spirit of St. Louis," probably the world's most famous plane.

Lindbergh had been urged to purchase a large tri-motored plane at a cost of more than \$100,000 for his transatlantic crossing. He had only \$15,000 to spend, and he found that Ryan was willing to design and build the plane he needed for about \$6,000, plus motor and instruments.

This became a high speed "Zero Defects" program, with minute attention to detail—a project in which any "almost-right" effort could have proved disastrous to the Lone Eagle.

Lindbergh was concerned constantly with reliability, and every item and component had to meet the test of 100 per cent usefulness, with personal comfort sacrificed. He insisted on perfection, and he got it from Ryan employees as they raced against time, knowing that several of Lindbergh's competitors were also pre-

Initiative Shown



INDIVIDUAL INITIATIVE reflecting spirit of "Builds Better" program was demonstrated recently by Agnes Ashton, production controlman, in the central factory crib, Building 120. Without direct instructions from supervision, she rearranged supply items, cleaned and painted shelves, and re-identified perishable tools with improved legibility, as shown in photo. The result was greater efficiency and better appearance of crib.

'Zero Defects' Work Earns Honor At Edwards Air Base



INDIVIDUAL MONTHLY AWARD for top "Zero Defects" workmanship with the Ryan field crew at Edwards Air Force Base in connection with the XV-5A testing program was presented recently to R. C. Saether, shown with, left to right, John H. Burhans, Ryan test base manager; T. M. Miller, maintenance supervisor; and W. A. "Bud" Meixner, operations and maintenance superintendent.

paring to fly the Atlantic.

He summarized the "Builds Better" attitude of Ryanites in his book, "The Spirit of St. Louis:"

"The workmen were out to set a record in construction time. A single day's delay might make the difference, and they were determined that the responsibility for such a disappointment would not lie with the man in the shop. Each of them was striving to do a quicker and better job on the Spirit of St. Louis than he ever did before. No pains were too great, and no hours too long. Lights some-

times burned in the factory all through the night."

The result was that when his plane was completed and flight-tested, it performed exactly as he ordered. Four decades later, in another epochal achievement, Ryan equipment performed exactly as ordered on the first soft lunar landing by an unmanned American spacecraft, the Surveyor, which would not have achieved its objective on the first attempt without perfect functioning of the Ryan Radar Altimeter and Velocity Sensor system.

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 8

RYAN AERONAUTICAL COMPANY

JULY 20, 1966

SPECIAL HONOR WON BY K.M. EMPLOYEES

Electrical Harness Assembly — Department 822-02 — holds the distinction of being the first department in any of the Ryan plants to win a quarterly award for outstanding performance in the "Builds Better" program.

For three consecutive months, this Kearny Mesa plant department attained

the top "Zero Defects" record, with the best combination of error rate improvement and sustained low error level.

A trophy, which will be retained by the department as a permanent possession, was presented in special ceremonies recently by L. M. Limbach, Vice President-Plant Operations. Among featured speakers at the ceremonies was M. P. Kissinger, Ryan Director of Quality Assurance.

Responsible for one of the key operations in the Kearny Mesa plant, Department 822-02 produces virtually all the wire assemblies for Ryan's major products, including Firebee jet target drones and all automatic navigator systems for fixed wing aircraft and helicopters.

Jack H. Eddy is General Foreman of the Kearny Mesa Plant, and Ray Cleveland is Foreman of Department 822-02.

APOLLO PROGRAM TASK FORCE GOES INTO HIGH GEAR

A recently formed "Let's Move!" Task Force has moved into high gear to insure on-time delivery of the vital Ryan landing radar system that will guide the Apollo Lunar Module to a soft touchdown on the

Harness Assembly Department Cited For Achievement



FIRST DEPARTMENT to win a quarterly award in "Ryan Builds Better" program is Electrical Harness Assembly, Department 822-02, in Kearny Mesa plant. Employees were honored recently at ceremony in which L. M. Limbach, Vice President-Plant Operations, presented a handsome trophy for its permanent possession.



TYPICAL WIRE HARNESS produced by award-winning department is displayed by M. P. Kissinger, Ryan Director of Quality Assurance. He emphasized importance of making certain that crimped connectors are secure before assemblers finish wiring electrical harness.

moon before the end of this decade.

Organized under Frank G. Jameson, Vice President-Programs, and J. R. Iver-

son, Director, Electronic and Space Systems, the Task Force has already accom-

(Continued on Page 2)

Top 'Builds Better' Award Presented At K.M. Plant



TOP PERFORMANCE for a recent month in "Ryan Builds Better" program at the Kearny Mesa plant was credited to Department 882-04, Model 147 "Black Box" Fabrication, represented in award ceremonies by, left to right, Joyce Kirkpatrick and Anne Sceniak. Banner and plaque were presented by A. C. "Tony" Richards, plant Superintendent, while Paul Vissat, Assistant Superintendent, at left, and Jerry Ryan, Coordinator of "Builds Better" program, look on.

APOLLO PROGRAM TASK FORCE NOW IN HIGH GEAR

(Continued from Page 1)

plished several objectives in slightly over one month's effort. These include:

Delivery in July of PP-7 (Pre-Production Model 7), to be used for flight testing at White Sands, N.M.; of PP-8 for systems

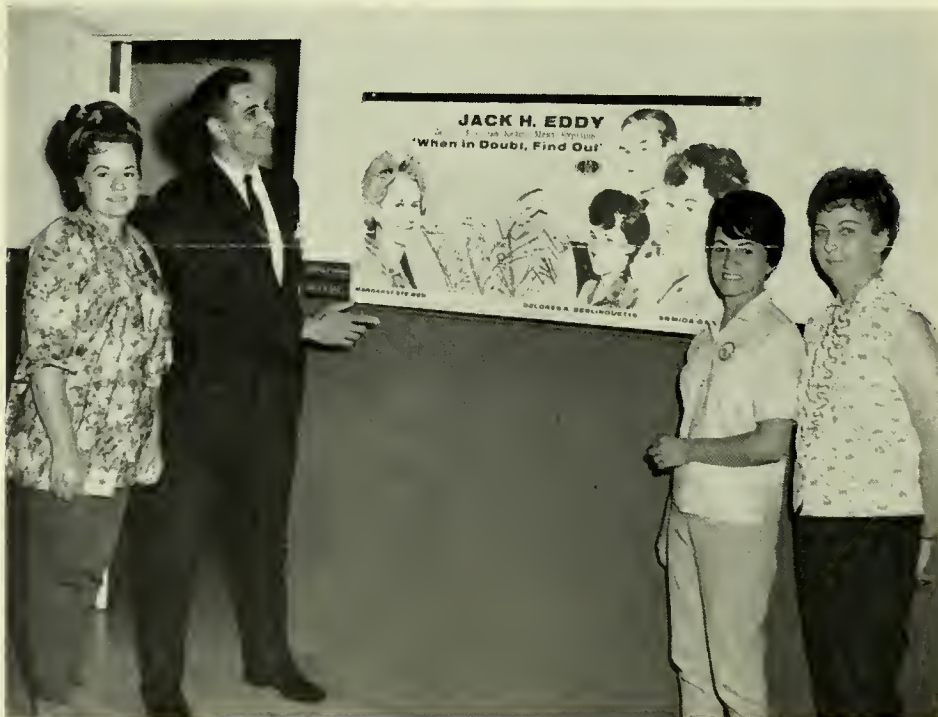
integration tests at Grumman Aircraft Engineering Corp., prime contractor to NASA for Apollo; P-9 (Production Model 9) for environmental tests by Grumman at the Manned Spacecraft Center, Houston.

Scheduled delivery in August of P-10 for the first unmanned earth orbital flight of the Apollo system.

Ryan's P-30 model will be aboard the first manned trip to the moon.

Stressing reliability through the Ryan "Builds Better" program, Jameson and Iverson pointed out that acceleration of pace of development of the Ryan radar system is essential to keep the entire program off the critical path. Key personnel from all departments of the company are involved in the "Let's Move!" Task Force.

'People Poster' Series Highlights Employees



FIRST IN "PEOPLE POSTER" SERIES is admired by Paul L. Vissat, Assistant Superintendent, Kearny Mesa plant, and, left to right, Tawana L. Todd, Jo Vesco and Margaret Bunnell, of Department 822-03, Magnetic Assembly. Featured in poster are Jack H. Eddy, General Foreman, and Margaret Steirer, Armida Garcia, and Delores K. Berlinguette, of Electrical Harness and Electronics Assembly departments.

VISUAL DISPLAYS CITE WORKMANSHIP OF RYAN EMPLOYEES

A unique means of calling attention to good workmanship in the "Ryan Builds Better" program has been launched with a series of large visual displays posted throughout all three plants.

The posters feature illustrations of employees with their supervisor and the product to which they are assigned.

First in the series depicted Jack Eddy, General Foreman, Kearny Mesa plant;

Margaret Steirer and Armida Garcia, both of Department 822-02, Electrical Harness Assembly; and Delores K. Berlinguette, Department 822-01, Electronics Assembly.

Pointing to a typical assembly operation, Eddy suggests, "When in doubt, find out," a good idea in striving to maintain Zero Defects performance.

In spotlighting employees who deserve recognition, the "People Poster" series is designed to inspire their co-workers to seek perfection in their tasks. More than

(Continued on Page 3)



TO ACHIEVE ZERO DEFECTS ON
MARINER '67'
WE MUST MAINTAIN THESE CONDITIONS...

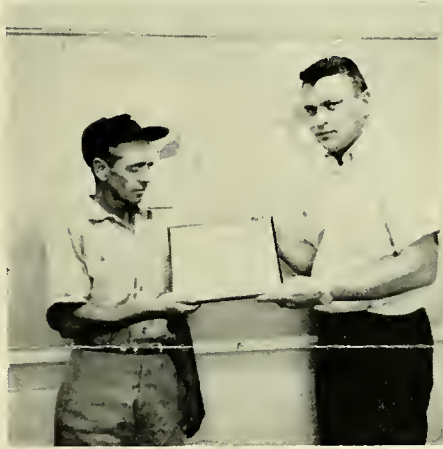
1. SAFE HANDLING
2. SAFE STORAGE
3. KEEP DUST & DIRT AWAY
4. CLEAN WHITE COTTON GLOVES
5. CLEAN PAPER ON TABLE
6. CLEAN AIR
7. AVOID UNNECESSARY HANDLING
8. AUTHORIZED MATERIALS ONLY



RYAN GOES TO VENUS ONLY WITH ZERO DEFECTS

ZERO DEFECTS in Ryan-built solar panel structures are essential to success of the Mariner '67' Venus probe, this poster reminds employees as a feature of the "Builds Better" program.

Firebee Field Service Crews Achieve 'Zero Defects'



'BUILDS BETTER' APPLIED TO SOLAR PANEL PROJECT

The "Builds Better" program is being intensively applied to an interplanetary project whose success depends on perfect performance of Ryan solar panel structures.

Extreme care in handling the panels for the Mariner '67' spacecraft, which will be sent to Venus on an exploratory mission

next year, is being emphasized during fabrication of the fragile structures. Deliveries of the first units were begun this month.

This is the third in the Mariner series for which Ryan has built solar panels to harness the sun's power for energy during long deep space probes. Several years ago, Ryan solar panels rode on Mariner II in a Venus mission. Last year, Mariner IV made a fly-by of Mars, during which it took 22 close-up photographs.

Recently, contact with Mariner IV 200 million miles from earth was dramatically re-established by the new 210-foot diameter antenna at the Deep Space Network's Goldstone Space Communications Station in the Mojave Desert, indicating that all its systems are still operating properly.

The Mariner series is powered by a "windmill" arrangement of four solar panels designed and built by Ryan. The aluminum structures are still intact on Mariner IV as they continue to utilize the sun's rays after more than 18 months in flight.

"ZERO DEFECTS" ACHIEVEMENTS of Ryan personnel in the Firebee jet target drone field crew at the McGregor Range, N.M., have been honored with presentation of merit certificates. Recipients of the awards from C. D. Miller, Ryan Base Manager,

were, left to right in photos at top, D. J. Stapp, field support engineer, and R. S. Mellen, target service mechanic; and left to right in photos below, R. Larceval, target service mechanic, and D. A. Tyler, target system technician.

VISUAL DISPLAYS CITE WORKMANSHIP

(Continued from Page 2)

60 of each poster in the series will be mounted in the Lindbergh Field, Electronic and Space Systems, and Kearny Mesa plants, with new "copy" every 2 to 3 weeks.

Ryanites at White Sands Missile Range Honored



OUTSTANDING PERFORMANCE in the "Builds Better" program by members of the Ryan crew servicing Firebee jet target drones at the White Sands, N.M. Missile Range has been recognized with award of individual certificates of merit to W. G. McCrary, target service mechanic, in photo left above; W. L. Myers, target system technician, photo center above; A. R. Sindelar, target service mechanic, photo right above; and Paul Blankenship, target service mechanic, photo left below. Congratulating them are, left to right, J. E. Young, Ryan Base Manager; and Serge Tonetti, Project Engineer, Target Branch, U.S. Army Missile Command.

with the wire wrap connector used on the power supply regulator in the Electronic Assembly. Some difficulty had been experienced in the simultaneous mating of the 38 connecting pins. The operation was time-consuming and somewhat hazardous to the treatment of the wire wrap pins on the flight equipment.

After discussing the problem with other test personnel, Ballard decided to try modifying this piece of test equipment. He made some small parts in his lathe at his own garage. They were fitted to the assembly. The modified part was adapted

to the test station, and it worked extremely well. The flight connector pins are now left in good, reliable condition after test operations.

Ballard was commended by his supervisors for his ingenuity and willingness to spend his own time in solving a problem of the Lunar Module program checkout.

Recently, he was awarded a special certificate as part of a six-man team that accomplished a 500-manhour error-free work period in testing components and sub assemblies for the Lunar Module Landing Radar System.

'EXTRA EFFORT' EXEMPLIFIED BY RYAN TECHNICIAN

The "extra effort" that enables Ryan to "build better" was exemplified recently by a laboratory electronic technician, senior, in Department 365 at the Electronic and Space Systems plant. Albert L. Ballard devised a means, in his garage at home, to improve the testing operations of the Lunar Module Radar Power Supply.



Albert L. Ballard

A connector had been designed to mate

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 9

RYAN AERONAUTICAL COMPANY

AUGUST 22, 1966

ERRORS SLASHED SIXFOLD BY DEPT. 896

A spectacular improvement in reduction of defects during the months of April, May and June earned for Department 896, Lunar Module Radar Final Assembly, the first quarterly award for outstanding performance ever won at the Electronic and Space Systems plant.

Production errors were slashed sixfold during a critical period when acceleration

of the pace of development of the landing radar system became urgent to meet target dates in the Apollo moon landing program.

The Ryan radar system will guide the Apollo Lunar Module to a gentle landing on the lunar surface with two American astronauts, scheduled before the end of this decade.

The "Builds Better" program's objective (Continued on Page 3)

* * *

3 Employees Win Special Awards

Three electronic assemblers of Department 896, Lunar Module Radar Final Assembly, Electronic and Space Systems plant, were honored this month for outstanding individual performances.

Don Couch and Gloria Parsell, of the first shift, and Jim Adkinson, of the second shift, received special recognition, adding to the honors received by the entire department,

which won the first quarterly "Builds Bet-



Don Couch

Electronic and Space Systems Employees Honored



FIRST QUARTERLY AWARD EVER WON at the Electronic and Space Systems plant was presented this month to Department 896, Lunar Module Radar Final Assembly, for sixfold reduction in defects during the months of April, May, and June. Hourly and supervisory employees of first and second shifts are pictured above and below as they receive permanent trophy from William J. Wiley, Director of Plant Operations.



ter" Zero Defects award made at the plant.

Couch and Adkinson were recognized for their diligence in assembly of the

Lunar Module radar antenna with a minimum of error. Mrs. Parsell was honored

(Continued on Page 2)

FIRST SPECIAL AWARD OF ITS KIND PRESENTED

The first special award of its kind ever made in the Ryan "Builds Better" program has been presented to Department 822-

02, Electrical Harness Assembly, at the Kearny Mesa plant.

Recognition was given the department for its outstanding sustained low defects record, and consisted of the original "Zero Defects" pennant presented employees of the Kearny Mesa plant by T. Claude Ryan, Board Chairman and Chief Executive Officer, when the "Builds Better" program was launched last year. Kearny Mesa was the second of the three Ryan plants at which this quality workmanship improvement plan was instituted.

The banner, which has been flown with the national colors on the Kearny Mesa flagstaff, was accompanied by a framed certificate stating:

"The continued efforts by the employees of Department 822-02 to reduce errors has resulted in a quality performance level approaching 'Zero Defects.' This example

(Continued on Page 4)

Original Banner



ORIGINAL "ZERO DEFECTS" PENNANT flown at Kearny Mesa plant, and framed certificate, comprised first special award of its kind, presented recently to Department 822-02, Electrical Harness Assembly, at Kearny Mesa.

Outstanding Sustained Low Defects Record Recognized



FIRST SPECIAL AWARD OF ITS KIND was presented recently by William J. Wiley, Director of Plant Operations, to employees of Department 822-02, Electrical Harness Assembly, for outstanding sustained low defects record. Recognition consisted of framed certificate and "Zero Defects" banner, shown at left.

CHECK THIS LIST FOR CORRECT CRIMPING



- ✓ WIRE SIZE
- ✓ PIN SIZE
- ✓ TOOL SETTING
- ✓ STRIPPED WIRE LENGTH
- ✓ WIRE DEPTH INTO PIN



RYAN BUILDS BETTER WITH ZERO CRIMPING DEFECTS

"CHECK LIST" POSTER serves as reminder of means by which crimping errors can be avoided in critical project being performed by Department 822-02, Electrical Harness Assembly.

3 Employees Win Awards

(Continued from Page 1)

for her efforts in disassembling and reassembling cordwoods that required rework

in support of test operations. All such cordwoods were salvaged, primarily through her efforts.



Gloria Parsell



Jim Adkinson

'Black Box' Fabrication Employees Win Honor



TROPHY FOR OUTSTANDING PERFORMANCE in "Builds Better" program during second quarter of 1966 was presented last month by M. P. Kissinger, Ryan Director of Quality Assurance, to Department 822-04, Model 147 Black Box Fabrication, Kearny Mesa plant.

In photo below, Chet Nosel, assistant foreman, dons bakers' cap with "Builds Better" insignia to slice large layer cake, bearing the same emblem, in refreshment highlight of award ceremonies.



ERRORS SLASHED BY DEPARTMENT 896

(Continued from Page 1)

tives were achieved by Department 896 coincidentally with formation of a "Let's Move!" Task Force headed by J. R. Iversen, Vice President-Electronic and Space Systems, and staffed by key personnel from all departments of the company, with responsibility of meeting schedules that would avoid any delay in the Apollo mis-

sion.

For attaining the best improvement record of any Electronic and Space Systems department, LM Final Assembly was presented a permanent trophy in ceremonies at the plant this month.

The department's accomplishment was performed under direction of Steve Thomareas, Assistant Superintendent; Robert

K. M. QUARTERLY AWARD GOES TO DEPT. 822-04

Outstanding performance in the Ryan "Builds Better" program during the second quarter of 1966 has won for Department 822-04, Model 147 Black Box Fabrication, the Craftsmanship Award for that period at the Kearny Mesa plant.

The department was presented a trophy,

which it will retain permanently, from M. P. Kissinger, Ryan Director of Quality Assurance.

Department 822-04 compiled the best all-around "Zero Defects" improvement record during the months of April, May and June.

Refreshment highlight of the award ceremonies was a large cake decorated with the "Builds Better" emblem.

'BUILDS BETTER' DISPLAY MATTER CREATED AT RYAN

Since inception of the Ryan "Builds Better" Zero Defects Program, many employees have commented favorably on the impressive posters and other graphics displayed throughout the Ryan plants. However, few are aware that this display material has been conceived and created, not by an outside advertising agency, but by our own Graphic Arts Department.

The professionalism maintained by this department, headed by Jim McGowan and Ron Evans, has established it as one of the most outstanding of its kind in the aerospace industry.

To sustain a high level of motivation for Zero Defects in job performance, P. Frank Freeman, a graphics consultant, was retained to design and create promotional items especially for the Ryan "Builds Better" Program. In this endeavor, he has been receiving excellent support from all departments. A measure of "BB" suc-

(Continued on Page 4)

Brumfield, Foreman, First Shift; D. A. George, Foreman, Second Shift; Laurel Dircks, Assistant Foreman, First Shift; and Larry Hansen, Assistant Foreman, Second Shift.

FIRST SPECIAL AWARD OF ITS KIND PRESENTED

(Continued from Page 2)

of fine craftsmanship serves as a constant reminder to their fellow employees that with continued emphasis on quality, the Ryan Builds Better goal can be achieved."

The special award closely followed another honor won by Electrical Harness Assembly. This department holds the distinction of being the first in any of the Ryan plants to win a quarterly award for outstanding performance in the "Builds Better" program. For three consecutive months this year, Department 822-02 attained the top "Zero Defects" record, with the best combination of error rate improvement and sustained low error level.

Due to the critical nature of the project in which the department is engaged, all employees are cognizant of the need for perfection in every operation, particularly wire crimping, since one loose connection can cause failure of an entire system.

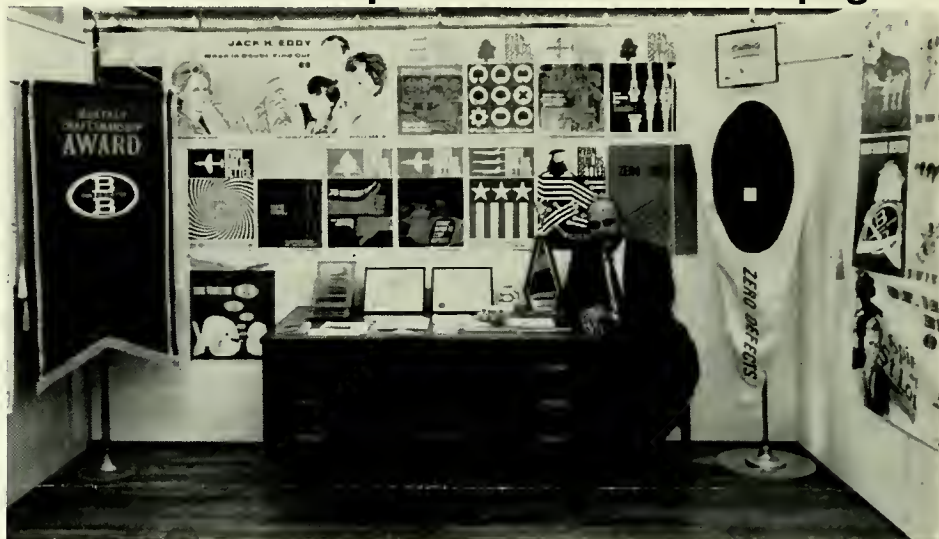
Constant reminder of the need to eliminate crimping errors have been provided through a check-list poster, calling attention to wire size, pin size, tool setting, stripped wire length and wire depth into pin to assure correct crimping.

Continental Official



"ZERO DEFECTS" PROGRAM will be extended to all Continental Motors Corp. plants under direction of Richard Park, seated, head of value engineering and "Zero Defects" at the Ryan subsidiary. On a recent visit here, he obtained pointers on Ryan's successful "Builds Better" program from Jerry Ryan, standing, its coordinator.

Visual Material Spurs 'Zero Defects' Campaign



VARIETY OF GRAPHIC MATERIAL designed to spur interest in the Ryan "Builds Better" Zero Defects program is displayed by P. Frank Freeman, Ryan graphics consultant. All the posters, charts and banners are products of the Ryan Graphic Arts Department.

'Builds Better' Displays Created at Ryan

(Continued from Page 3)

cess is the fact that numerous requests for advice and samples of Ryan material have been received from other companies, as well as the Department of Defense.

Before coming to Ryan, Freeman worked several years in Europe as a Graphic Art Director for the U. S. Government. Later he was Designer of Art and Editorial Material at Convair. In addition to being a graphics consultant, Mr. Freeman is also a financial consultant dealing in mutual funds and insurance, with office located in the Fifth Avenue Financial Centre.

As indicated by the most recent postings, Ryan has embarked on a new series of "people posters" featuring Ryan employees. Those whose pictures are chosen

to appear on posters throughout all Ryan plants will be selected by their immediate supervisors based on maintenance of high quality job performance. For the most part, these posters will be illustrated by Bob Watts of Graphic Arts.

Dept. 822-03 Honored

Department 822-03, Magnetic Assembly, was awarded the monthly craftsmanship award for best performance of any department in the Kearny Mesa plant during July in reduction of errors in the "Builds Better" program aimed at Zero Defects. Ed Foster is department foreman.

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 10

RYAN AERONAUTICAL COMPANY

SEPTEMBER 23, 1966

FABRICATION ON NEW SUPERSONIC FIREBEE BEGINS

Ryan's new generation of the famed Firebee jet target drone family is moving into the production spotlight as engineering and tooling of the sleek, supersonic Firebee II proceeds toward completion.

From its inception, the "Ryan Builds Better" concept of quality workmanship,

aimed at a Zero Defects goal, has governed the supersonic Firebee II project under a Naval Air Systems Command contract.

"We are endeavoring through the 'Builds Better' program to extend to the supersonic Firebee II the standards of excellence established in producing some 3,000 subsonic Firebees during nearly 18 years," Ron A. Reasoner, Model 166 Program Manager, declared this week.



Ron A. Reasoner

"Many years of production of this new generation of Firebee lie ahead if we maintain such standards."

Except for Ground Support Equipment and Special Support Equipment, which are due for completion next month, engineering design has been virtually completed.

Tool planning is more than two-thirds finished, tool design is more than half complete, and tool fabrication is more than one-third done. Machining of detailed parts is under way, and assembly of the static test "bird" will begin before the end of this year, with completion slated next March, and delivery to the Pt. Mugu Pacific Missile Range in June, following flotation tests in San Diego Bay, and static tests at the main plant.

Four additional supersonic Firebees in the original order, for use as flight test models, will enter the assembly line at the San Diego Plant early in 1967. They

(Continued on Page 3)



CUTAWAY MOCKUP OF SUPERSONIC FIREBEE II showing electrical/avionic equipment compartment is checked by engineering personnel as new generation of Ryan jet target drone family nears production spotlight. Left to right, standing, Paul Downey, control and stabilization group engineer; Bill Hoy, structural design group engineer; and Frank Palfy, stress group engineer.

Kneeling, Ed Wendorf, program office coordinator; Gus Schwartz, aerodynamic group engineer; and Herb Kulick, electrical design engineer.

Special Issue Highlights Ryan Supersonic Firebee

Growing importance of the Navy supersonic Firebee II program at Ryan is highlighted by this special issue of the "Builds Better Bulletin." Featured are various aspects of the new generation of jet target drones in which the company has attained international leadership.

Known within the plant as the "Model 166," the Supersonic Firebee II has an unparalleled long range production potential, based on the ability of Ryan to meet schedules at a Zero Defects level. This is the permanent goal of the plantwide "Builds Better" concept, now being demonstrated by all employees involved in the engineering, tooling, machining and ultimate assembly and testing of America's highest performance jet target.

Jerry Ryan
"Builds Better" Coordinator

NAVY BOARD TO REVIEW PROGRESS

A Navy review board of approximately 50 military personnel will meet with key Ryan officials Sept. 27, 28 and 29 in San Diego to check every phase of progress in the Model 166 supersonic Firebee II project.

This intensive examination, customary in the development of new defense systems, will cover in great detail the design, engineering, scheduling and fiscal aspects of the program.

A full-scale supersonic Firebee II mockup, with equipment installed, will be assembled for the conference.

Ryan personnel will be organized into five committees for the purpose of presentations of every aspect of the project to date. These groups will include:

Contractual Requirements, Fiscal and

(Continued on Page 2)

NEW TECHNIQUES USED IN TARGET DRONE PROJECT

The "Ryan Builds Better" program highlights new techniques that will enable production of a higher performance jet target drone—the supersonic Firebee II—with fewer parts than in the subsonic Firebee.

A prime example is the use of a solid honeycomb core for the wing, eliminating

the need for ribs, stiffeners and rivets. Not only is there a savings of hundreds of parts, but a reduction of weight—a vital factor—will be effected.

And in the machining of intricately shaped parts, numerically controlled five-axis milling machines can accomplish drastic reductions in manhours, in contrast with conventional equipment. For instance, an umbilical fitting on the supersonic Firebee fuselage can be milled in 12 hours, as compared with 80 to 90 hours by older methods.

NAVY TO ACQUIRE 10 MORE 'BIRDS'

The Navy has exercised its option to acquire 10 additional Ryan supersonic Firebee II jet target aircraft as a follow-on to its original order for five "birds" in the initial research and development phase.

These are scheduled for delivery, at the rate of two per month, starting in December, 1967, in a \$2.1 million contract, that boosts the total Bureau of Weapons contracts for this new generation Firebee to \$7.9 million.

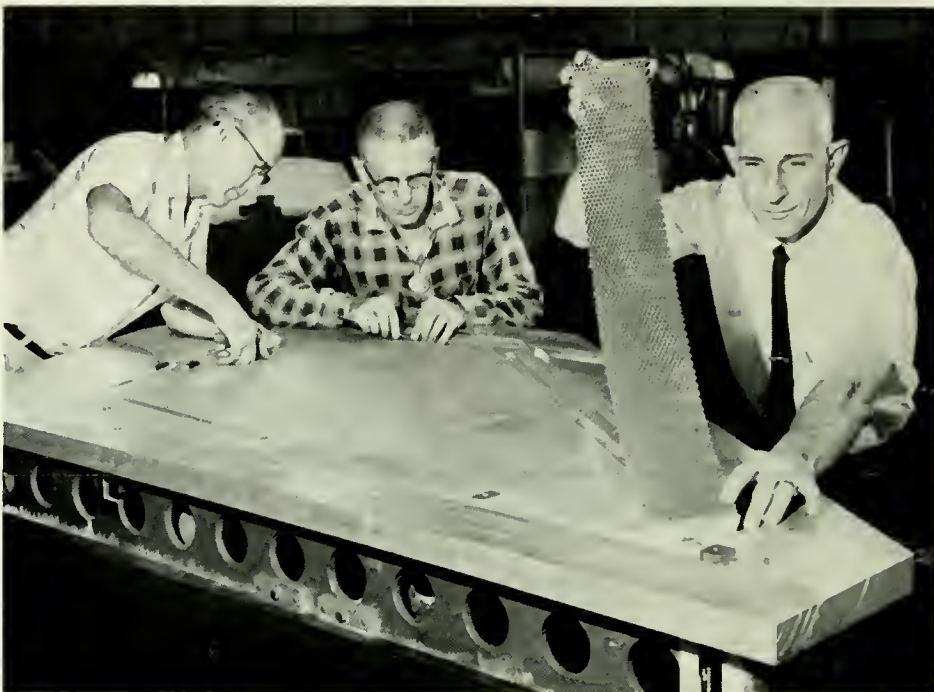
With technical assistance from Ryan, the Navy will utilize these 10 drones for operational evaluation purposes, in the wake of the flight test program to be conducted at Pt. Mugu Pacific Missile Range by the Navy and Ryan with the first group of supersonic Firebees.

Navy Review Board Due

(Continued from Page 1)

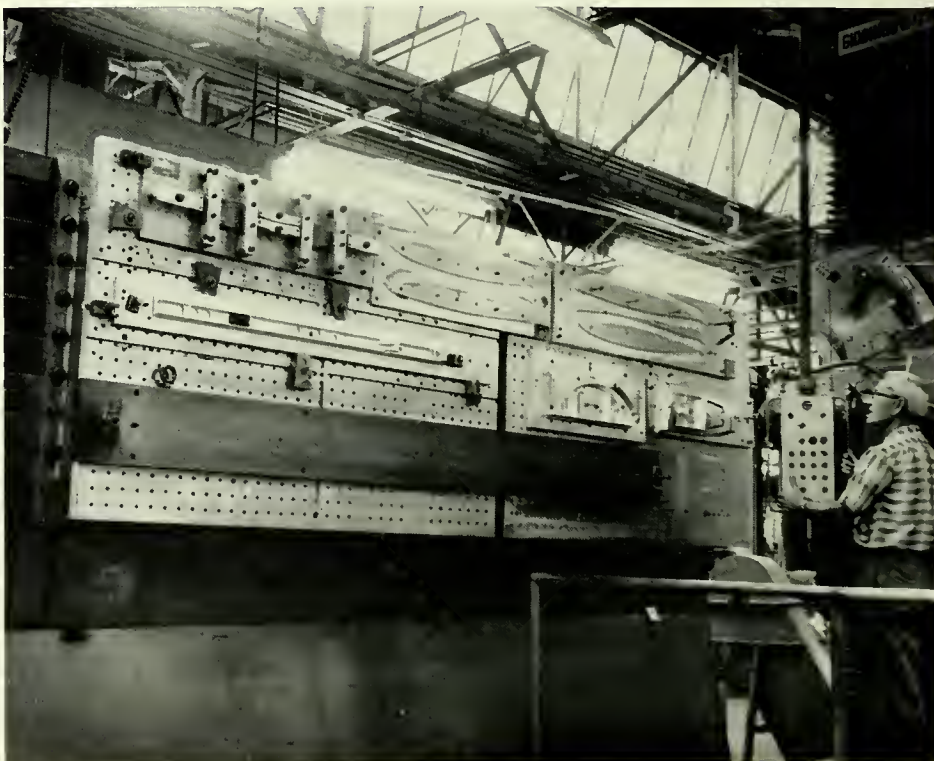
Scheduling; Instrumentation and Flight Test; Electrical and Electronics; Support, Spares and Ground Support Equipment; and Design and Technical.

'Honeycomb' Provides Solid Core For Firebee II Wing



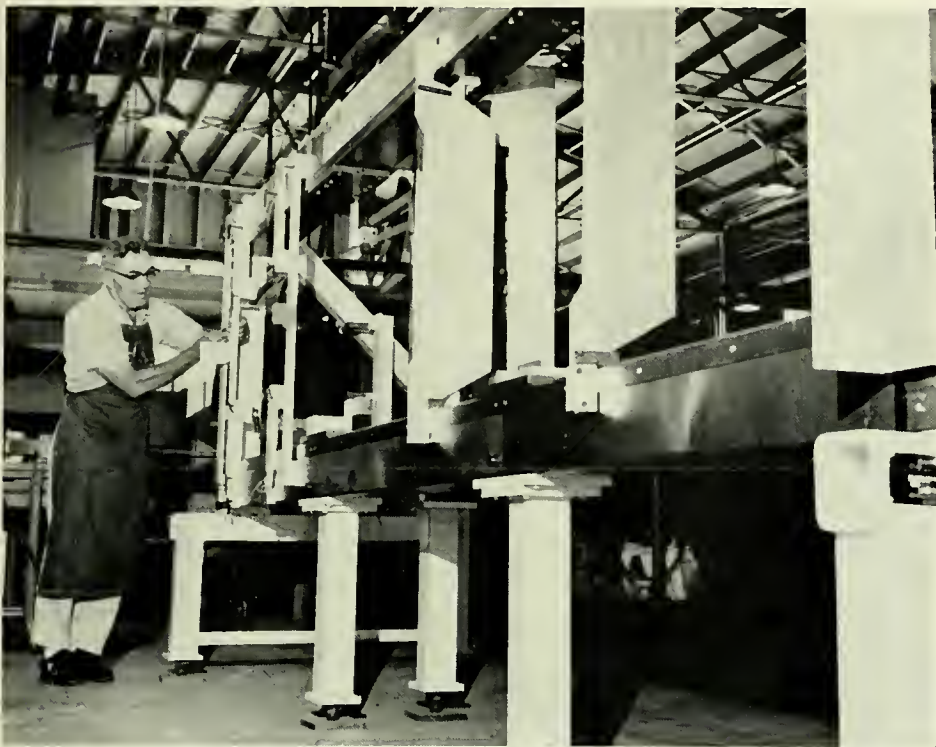
ALUMINUM HONEYCOMB CORE enabling fabrication of solid wing, eliminating ribs, rivets and stiffeners on Navy Supersonic Firebee II project, is displayed by Harry Stovall, right, tooling inspector, as Harry A. Foster, left, and Thomas V. Jefferson, center, toolmakers, complete fixture in which core is bonded to stainless steel skin.

Giant Machine Mills Intricately Shaped Parts



GIANT FIVE-AXIS MILLING MACHINE, numerically controlled, with all information for its operation punched on tape, is used for machining intricately shaped parts of Navy Supersonic Firebee II jet target drone. Operator is Marvin O. Tooley, master machinist.

Fixture Readied For Sub Assembly Operations



CHECKING COMPLETED SUB ASSEMBLY FIXTURE for fuselage section of Navy Supersonic Firebee II jet target drone is W. A. Carr, jig builder.

Mating Jig For Firebee II Fuselage Nears Completion



MATING JIG for Navy Supersonic Firebee II fuselage nears completion for start of assembly of first of new generation of jet target drones. Jig and fixture builders, left to right, W. D. Butcher and Harold C. Korn.

NAVY MAINTAINS LEADERSHIP IN TARGET DRONES

When the Naval Air Systems Command asked Ryan to develop a supersonic Firebee, it reflected the Navy's interest in maintaining leadership in utilizing the most advanced target drone techniques for evaluation of its missile systems and in sharpening the air defense marksmanship of its gunnery crews.

Numerous Firebee "kills" have been scored by Navy ships and aircraft in the years that the near-sonic BQM-34A's have operated with the Pacific and Atlantic Fleets.

In its pioneering use of the Firebee, the Navy has developed various methods to make it the most realistic target in the nation's arsenal, capable of operating at extremely high and low altitudes (ranging from 50 feet to over 60,000 feet above sea level) capabilities, and sharply increased maneuverability to simulate evasive tactics of enemy planes.

The supersonic Firebee will provide new challenges in Fleet readiness exercises and evaluation of shipborne surface-to-air and fighter aircraft air-to-air missile systems. It will perform at 50 feet altitude at more than 800 miles per hour (Mach 1.1), and will be able to climb and accelerate, after either air or ground launch, to altitudes in excess of 60,000 feet, reaching speeds of 1,000 miles per hour (Mach 1.5). It is also designed for maximum speeds of 1,190 mph (Mach 1.8) at 50,000 feet.

Ultimately, a growth version of the supersonic Firebee II, with a greater thrust engine, is envisioned to provide speeds of Mach 2.40 (1,575 mph).

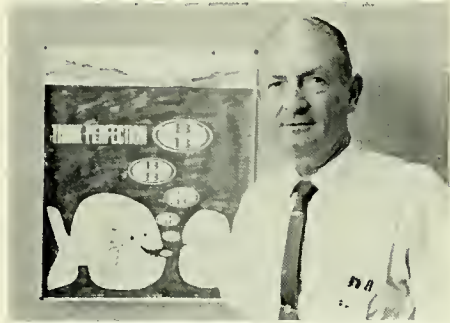
Firebee II Assembly Nears

(Continued from Page 1)

will be delivered to Pt. Mugu in mid-year for tests, using the Navy's long-proven air launch technique, in which the target drones are dropped from a DP-2E aircraft. Later, existing ground launch facilities of the subsonic Firebee will be modified to enhance operational versatility of the supersonic Firebee.

Realization of the full long-range production potential of the Firebee II as it exerts its role in maintaining the Navy's high level of air defense preparedness depends on ability of Ryan to meet schedule commitments and performance reliability.

Firefish 'Built Better'



"BUILDS BETTER" concept in Firefish program features "Think Perfection" slogan, on poster displayed by John W. Short, Project Engineer.

'Think Perfection' Is Slogan of Target Boat Project for U. S. Navy

Ryan's water surface counterpart of the aerial Firebee jet target drone—the Navy Firefish target boat—has come within the scope of the "Builds Better" program.

"Think Perfection" has been adopted as one of the slogans in production of the high-speed, radio-controlled craft that simulate enemy PT-boats in Fleet gunnery drills.

"In committing ourselves to the 'think perfection' concept, we aim to overcome any tendency toward errors," John W. Short, Project Engineer, commented.

"This is the positive way of counteracting the idea that since human beings are not perfect, mistakes are inevitable."

Among the visual displays designed to encourage this approach is a "Think Perfection" Firefish poster, which bolsters the Zero Defects technique.

"By 'thinking perfection,' every employee takes a long step toward achieving

Supersonic Firebee Team Managers Confer



SUPERSONIC FIREBEE II TEAM managers huddle for conference. Seated at table, from left, are Model 166 Program Manager Ron A. Reasoner; M. S. Sevelson, Project Engineer; K. C. Packard, Program Office Controls; E. G. Wendorf, Program Office Administrator; and W. E. Grago, Manager, Targets & Drones.

the quality demanded by the Navy in this project," Short said.

A new order has been awarded Ryan for Firefish boats, as a follow-on to the initial contract for the vessels in late 1964. At that time attacks by enemy PT-boats on U.S. ships in the Gulf of Tonkin off South Viet Nam stressed the need for defense preparedness against this type of surprise assault.

Since early 1965, the 17-foot Fiberglass-hulled Firefish target boats have been in operational Navy-wide use as realistic gun-

nery exercise vehicles, and some 15 have been sunk by ships and aircraft in Fleet exercises.

Radio controls command the boat to turn, increase and decrease speed, and complete a broad range of evasive maneuvers. The Firefish is powered by a 120 h.p. inboard engine, and is capable of cruising endurance of up to six hours and speeds to 30 knots. It has a radar acquisition range of about six miles, and can be radio-controlled by surface vessels or aircraft.



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 11

RYAN AERONAUTICAL COMPANY

OCTOBER 20, 1966

RELIABILITY GOAL SET FOR FIREBEE II

The world-renowned performance reliability of the Ryan subsonic Firebee jet targets, proved over an 18-year period of producing some 3,000 of the "birds," will be extended to the new supersonic generation of remote-controlled drones through application of "Builds Better" Zero Defects principles.

This determination pervaded the Firebee Target System Navy Program Review meeting conducted by more than 40

Navy officials who conferred with Ryan program personnel Sept. 27-29 in San Diego to check status of the Model 166 Supersonic Firebee II project.

The group also included 5 representatives of the Air Force, indicating that service's interest in the Navy project. Ryan last year was awarded a Navy contract in excess of \$5 million for design, development and fabrication of five supersonic Firebees, capable of performing at altitudes ranging from 50 feet to more than 60,000 feet, and at speeds of more than 1,100 miles per hour. Recently, the Navy exercised its option to acquire 10 additional Supersonic Firebee II targets, in a \$2.1 million contract.

The Review Board was impressed with progress of the developmental program, on which engineering is virtually complete, with tooling well under way, and fabrication of detail parts begun. Assembly operations are scheduled to start late this month.

During the three-day session, an intensive review was conducted of every phase of the program, including flight test parameters, engine, ground support equipment, avionics, performance characteristics, tooling, manufacture and fiscal status.

William E. Grago, Ryan Manager of
(Continued on Page 2)

Ryan-Navy Supersonic Firebee Review Team Leaders



RYAN-NAVY REVIEW TEAM which studied progress of Ryan Supersonic Firebee II design-development program in three-day conference in San Diego recently were led by, left to right, Ron Reasoner, Ryan Firebee II Program Manager; Comdr. Fred Wilder, Navy Targets Project Manager; Bill G. Dowell, Navy Target Project Engineer; and M. S. Sevelson, Ryan Firebee II Project Engineer. Cutaway model of new generation of famed Ryan jet target drones is visible in background.

RYAN RADAR SUCCEEDS ON SURVEYOR II DESPITE OVER-ALL MISSION FAILURE

Perfect operation of the Ryan landing radar system, which made possible a soft landing of the Surveyor I space craft on the moon last June, was repeated in Surveyor II despite failure of the more recent mission to reach the lunar surface.

When one of the vehicle's three vernier engines failed to ignite, Surveyor II began tumbling and the ultimate mission

had to be abandoned. However, while in this state, the Ryan radar was activated to test it under conditions of low battery power.

To conserve energy, all other equipment including the descent camera, was turned off during the critical moments the radar was operating to help guide

(Continued on Page 2)

RYAN RADAR SUCCEEDS ON SURVEYOR II

(Continued from Page 1)

Surveyor I to a gentle touch down on the moon. However, on Surveyor II, other equipment continued to drain the battery energy while the Ryan radar was operated for five minutes near conclusion of the flight that ended in a crash landing on the moon. Recharging of the battery by Surveyor's solar panels had been impossible during the tumbling.

The rugged radar, which had survived the launch, midcourse correction, and the long translunar flight, functioned perfectly, thus providing valuable proof that it will operate under low battery power condition. The test demonstrated that in future Surveyor missions, other equipment can continue operating while the radar performs its task during the final seconds of landing approach.

Another example of how the "Ryan Builds Better" program provides reliability essential to the space effort.

Monthly Craftsmanship Award At Electronics Plant



BEST PERFORMANCE by any department in Electronic and Space Systems plant during month of June won for Department 896 (LM Motherboard Final Assembly), "Builds Better" plaque and banner. Robert H. Guyer, Factory Manager, presents plaque to Nancy Brock on behalf of first shift employees in photo above. R. G. "Dick" Wells, Manufacturing Superintendent, makes presentation to Mary Borowik for second shift employees (photo below).



Award At Kearny Mesa



RECENT MONTHLY CRAFTSMANSHIP award at Kearny Mesa plant was won by Department 822-02, Electrical Harness Assembly, for outstanding record in reducing defects to achieve general all-around excellence in quality performance.

Violet Vallieres and Alberta Michaelson represent employees of department as fourth bar is added to plaque bearing three, representing honors for first quarter of 1966.

Department is congratulated by, left to right, Paul L. Vissat, Assistant Superintendent; A. C. "Tony" Richards, Superintendent; and Jerry Ryan, "Builds Better" Program Coordinator.

Reliability Goal Set For Supersonic Firebee II As Navy Board Concludes Periodic Review In S. D.

(Continued from Page 1)

Drone Programs, and Ron Reasoner, Ryan Program Manager for the Supersonic Firebee II, served as co-chairman of the conference. The Navy review team was head-

ed by Comdr. Fred Wilder, Navy Targets Project Manager, and Bill G. Dowell, Target Project Engineer, both representing the Naval Air Systems Command in Washington, D.C.

COLOR POSTERS MADE BY SILK SCREEN METHOD

Because their work is under constant scrutiny of virtually all employees at one time or other, Ryan silk screen reproduction specialists realize the importance of high quality workmanship.

The silk screen technique has been used extensively for covers on proposals and reports, and for lettering on such components as the front panels of "black boxes" used in the Firebee and electronics projects.

Now for the first time, this method has been employed for color posters in the Supersonic Firebee II "Builds Better" program. Approximately 200 such posters have been produced for display at all plants and more are planned. The work of silk screen specialists in the Engineering Reproduction Department has reduced cost and time of delivery from outside contractors who previously had done this type of job.

Quality of the color work on the posters is outstanding, according to P. Frank Freeman, graphics consultant who has been retained by Ryan to design and create promotional items for the "Builds Better" Program.

SPECIAL AWARDS GIVEN 2 RYANITES

(Continued from Page 4)

uration of this manufacturing method has resulted in a much higher quality product, with additional savings to Ryan in time and production costs.

Dominguez was awarded his special commendation for suggesting use of a Dennison Copier to make representation copies of the LM "motherboards" for visual and masking purposes. This new method is resulting in greater efficiency and is reducing the possibility of defects on electronic assemblies for the LM Landing Radar.

The special awards to individuals in the "Builds Better" program recognize initiative in making proposals that will lead to reduced defects and will generally improve quality performance.

Space Assembly Shop Wins Second Monthly Award



FOR SECOND MONTH THIS YEAR, Department 896, Space Assembly Shop (Surveyor) won the Craftsmanship Award for best "Zero Defects" performance in the Ryan "Builds Better" program. This department previously won such recognition last May. Newest honor is for July performance.

Plaque was presented by R. G. "Dick" Wells, Manufacturing Superintendent, Electronic and Space Systems, to Jan Kessler, representing first shift (photo above), and to Kay Turner, representing second shift (photo below).



Ryan Employees Exceed 'United Crusade' Goal

A new company record was established in the 1966 United Community Services' "United Crusade" campaign, conducted in a whirlwind one-week period this month.

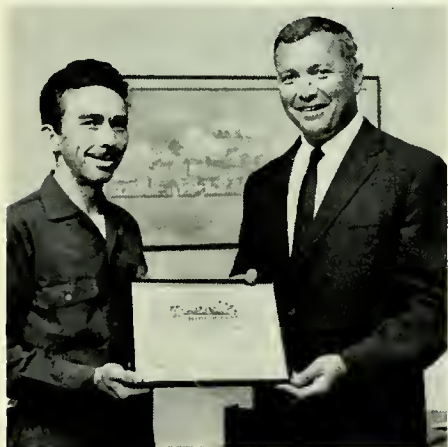
More than \$71,000—\$6,000 over the \$65,000 goal—was donated by Ryanites, primarily through the payroll deduction plan. Every one of the five teams, repre-

sented Manufacturing, Targets and Drones, Management Offices, Electronic and Space Systems Plant, and Kearny Mesa Plant, surpassed their goals, achieving as high as 130 per cent of quota. A new high was set in percentage of participation in the continuous payroll deduction plan.

Individual Honors Won



SPECIAL AWARD CERTIFICATES for individual efforts supporting the Ryan "Builds Better" Zero Defects program were recently presented by J. R. Iverson, Vice President-Electronic and Space Systems, to J. G. Rockstroh, now third shift assistant foreman, main plant machine shop (photo above), and to Ray Dominguez, (photo below), second shift molder magnetic components utility, Electronic and Space Systems plant.



SPECIAL AWARDS GIVEN 2 RYANITES

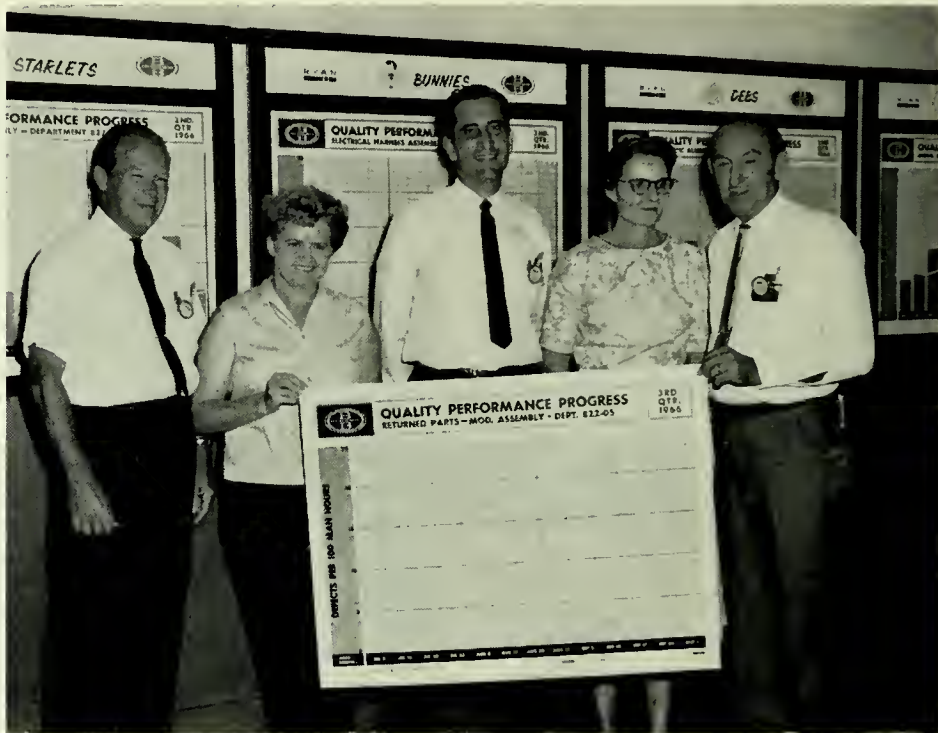
Individual efforts of two Ryanites have been honored by Special Awards in the "Builds Better" Zero Defects program.

They are Joseph G. Rockstroh, who recently was promoted to third shift assistant foreman, main plant machine shop; and Ray Dominguez, second shift molder magnetic components utility, in the Lunar Module (LM) Landing Radar program, Electronic and Space Systems plant.

Rockstroh was recognized for his suggestion to redesign and manufacture by vacuum molding the transformer cups for the high voltage power supply on the Model 523 Navigation System, thus eliminating machining requirements. Inaug-

(Continued on Page 5)

New Department Joins 'Builds Better' Competition



NEW DEPARTMENT AT KEARNY MESA PLANT was welcomed recently into the Ryan "Builds Better" quality performance competition. Department 822-05 will specialize in reworking and repairing parts returned from service in the field, and in modification assembly for special types of projects turning out units on a limited basis.

Chart on which quality performance progress is plotted is displayed by, left to right, Harry Wisner, department foreman; Wilma Gezovich, Paul L. Vissat, Assistant Superintendent, Kearny Mesa; Opal McClure, and Jack H. Eddy, General Foreman. Miss Gezovich and Mrs. McClure represent hourly employees in department.

Ryan Test Crew Members Honored At Edwards AFB



BEST INDIVIDUAL recent monthly "Zero Defects" performances with the Ryan field service crew at Edwards Air Force Base were honored with presentation of special award certificates to L. E. Walker, J. E. Mayes and R. L. Conklin by W. A. "Bud" Meixner, at left, Operations and Maintenance Superintendent; and John H. Burhans, at right, Ryan Test Base Manager.

DISPLAYS FOCUS ATTENTION ON QUALITY WORK

Special displays focusing attention on quality performance in the "Builds Better" competition between departments have been installed at the Kearny Mesa and Electronic and Space Systems plants, and are being extended to the main San Diego plant.

Centerpiece is a "Quality Performance Progress" chart showing a week-by-week record of defects per 100 man hours, and indicating at a glance either the improvement being made or the need for improvement.

Solid columns rising from the bottom of the chart show the number of defects each week, and a continuous yellow line displays the improvement trend.

If the department has won one or more monthly awards for outstanding performance in the "Builds Better" program, its "Craftsmanship Award" is mounted beside the chart, along with metal bars suspended beneath the plaque to denote the number of prize-winning months.

In departments recognized for the best combination of error rate improvement and sustained low error level during an entire three-month period, a trophy representing the Quarterly Craftsmanship Award is displayed on the other side of the chart.

Unique Earring Set



EARRING SET produced from "Builds Better" pins belonging to J. R. Fullerton, left, Group Engineer, Welding, Material and Process Laboratory, and L. E. Leech, Welding Engineer, is presented Lila Potter, general clerk. It was Fullerton's idea, but Leech did the actual soldering, so won the privilege of adjusting the earrings.

Top Prize Won By Electronics Assembly Department



A CLOSE SECOND SEVERAL TIMES IN RECENT MONTHS, Department 822-01, Electronics Assembly, was awarded the top prize in the "Builds Better" competition for the month of August in the Kearny Mesa plant. In photo above, "I'm A Winner" buttons (depicted at right below) are distributed by Dietmar R. Geissler, Assistant Foreman, to employees. Shown are Mary Hofer, Barbara Sachs, Jeanette Hurtado and Ellie Porter.

Representing department in receiving banner and plaque from L. M. Limbach, Vice President-Plant Operations, and W. A. Irvin, Foreman, are Mary Hofer and Marylyn Goodman. Department has 55 employees. This department's 55 employees were the first in any of Ryan plants to receive the newly designed red-and-white "I'm A Winner" buttons.



'Builds Better' Award



BEST "BUILDS BETTER" RECORD for a recent month's period was established in Kearny Mesa plant by Department 822-03, Magnetic Assembly, in continuing plantwide competition to achieve highest quality performance levels.

Mel Felman, molder magnetics, and Bernadette Robbins, coil winder, receive plaque from W. J. Wiley, Director, Plant Operations, at left, and Ed Foster, department Foreman.

ACCURACY VITAL IN INSTALLING HUGE MACHINE

The extreme accuracy with which work must be performed at Ryan is being exemplified this month with installation of the first of five huge milling and drilling machines — the largest single machine tool expansion program here in many years.

Being installed on a foundation for which a pit 16 feet, 6 inches wide, 37 feet long and 6 feet deep was excavated in the machine shop at the San Diego plant is a huge Giddings & Lewis single spindle, five-axis numerically controlled machine.

Reliability of the critical aerospace items to be produced by this machine will depend in great measure on the accuracy achieved in its installation. Optical instruments are being used to make sure that the entire surface of the machine bed is set at a virtually 100 percent level plane.

Weighing more than 200,000 pounds, this is one of the heaviest machines ever put into service at Ryan. Due soon are three other large milling machines and one drilling machine, all to be controlled by a punch tape produced by a computer to improve accuracy and drastically reduce time expended with conventional equipment.

Lunar Module Department Wins 'Builds Better' Award



BEST "BUILDS BETTER" PERFORMANCE for August in Electronic and Space Systems plant was recorded by Department 896, Space Assembly Shop (Lunar Module). First shift employees were honored in presentation of plaque by Steve Thomareas, Assistant Superintendent, to Pam Delfosse (photo above); second shift employees were represented by Bonnie Dunand, in plaque presentation by R. G. "Dick" Wells, Manufacturing Superintendent (photo below).



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311

San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 1, NO. 12

RYAN AERONAUTICAL COMPANY

NOVEMBER 23, 1966

100 PERCENT RELIABILITY IS PROGRAM AIM

Proof of success of the Ryan "Builds Better" approach to quality workmanship is 100 percent reliability of products in use and repeat business from major customers.

On the basis of these criteria, the company's precision work on a variety of solar panel structures in recent years has been eminently successful.

By applying the "Zero Defects" principle of craftsmanship, there have been no failures of such Ryan structures in any of the space flights in which the panels have been utilized. And the satisfied customers have returned to Ryan for more panels on new projects.

Ryan solar panel structures have flown in the deep space probes of Mariner II (to Venus) and Mariner IV (to Mars); on the successful Ranger spacecraft to the moon, on Explorer B, the satellite testing application of lasers in space; on Navy Transit navigational satellites, and on GEOS (Geodetic Orbiting Satellite), a National Aeronautics and Space Administration spacecraft. The electrical systems, which rely on the capture of the sun's power by the solar cells installed on the Ryan panels, have functioned perfectly.

As a matter of fact, after more than 20 months in space, the aluminum-structured, epoxy dielectric-faced Ryan panel structures were still intact on Mariner IV, with which contact was dramatically re-established by the new giant antenna at the Deep Space Network's Goldstone Space Communications Station in the Mojave Desert.

The "windmill" arrangement of four solar panel structures continued as the primary power source while they remained locked on the sun nearly two years after launching.

Recently completed by Ryan were

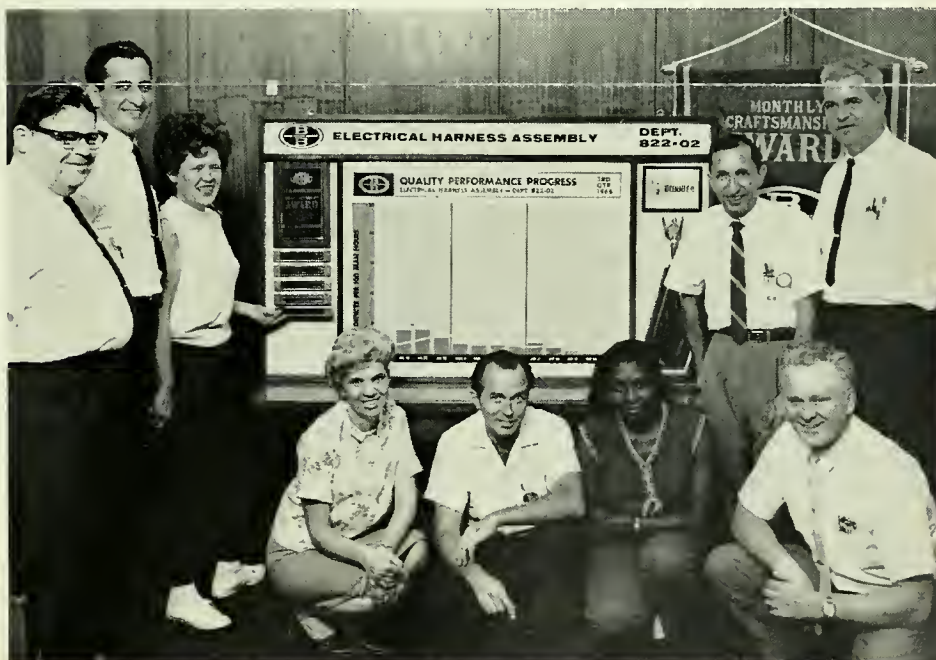
(Continued on Page 2)

"Winners" In Most Honored Department Celebrate



"I'M A WINNER" BUTTONS are displayed by employees of Electrical Harness Assembly, above, Department 822-02, Kearny Mesa, after presentation of monthly "Builds Better" award for September. At left, Ray Cleveland, Foreman, and at right, Jerry Ryan, "Builds Better" coordinator. This department has won quality performance awards more times than any other group in all plants—the most recent prize being its fifth monthly award, in addition to the quarterly award for the first three months of 1966.

In photo below, note low volume of defects on chart. Left to right, Ray Cleveland, Foreman; Paul Vissat, Assistant Superintendent; Alberta Michaelson, Violet Vallieres, John Grennan, Aileen Ward, and Gabe Baccash, Chet Nosel (kneeling), and Ed Carson, the latter three, Assistant Foremen.



COMMON-SENSE SUGGESTION SAVES MATERIAL

Expensive spoilage of material has been averted in the Model 166 Supersonic Firebee project by a common-sense suggestion by a veteran of 26 years' Ryan service.

Jerry Haight, power brake operator, Department 100, Fabrication, noted difficulty in forming the leading edge of the wing in the newest generation of the famed Firebee jet target drone family. The direction of the grain structure of the stainless steel skin sheet made it subject to crack-

ing, and the problem was further complicated by the fact that the bend radius was under the minimum to meet the aerodynamics requirement.

An obvious solution would have been purchase of additional material, in which the grain could be rotated 90 degrees to bend direction. But this would have required a special mill run, and would have involved considerable expense.

Haight suggested use of a technique that had worked in the past on other jobs. He placed scrap aluminum between the stainless steel sheet and the brake die, enabling the tight radius required to be formed without rupture.

The result was saving of the stainless steel material, and elimination of the necessity of seeking additional costly material with an accompanying loss of fabrication time.

Haight won high praise for his solution from Adolph Bolger, Assistant Superintendent, and Chet White, Assistant Foreman, Department 100.

"It was a good example of applying Ryan 'Builds Better' techniques to a difficult problem," Bolger said.

TOTAL RELIABILITY IS "BUILDS BETTER" GOAL

(Continued from Page 1)

panels for Mariner 67, another Venus space probe; and for DODGE (Department of Defense Gravity Experiment), due for launch early in 1967.

Under construction at Ryan now are panels for a continuing Navy Transit program and for a development model to

(Continued on Page 3)

Supersonic Firebee Wing Forming Problem Solved



DIFFICULT PROBLEM IN FORMING stainless steel material for the leading edge of the Model 166 Supersonic Firebee wing was solved by Jerry Haight, center, Ryan brake operator, with suggestion that won praise of Adolph Bolger, at left, Assistant Superintendent, and Chet White, Assistant Foreman, Department 100. They are shown examining part after it was successfully formed.

Second Quarterly Award Won By Department 822-04



TWO-TIME QUARTERLY AWARD WINNER in "Builds Better" program is Department 822-04, 147 Black Box Fabrication, Electronic and Space Systems plant, which received coveted honor for second and third quarters of 1966. Representing employees at ceremonies honoring department's most recent excellent quality performance improvement were group pictured above, with Hazel Bradshaw receiving engraving and trophy from M. P. Kissinger, Director of Quality Assurance, and Dick Simmons, Foreman.

DISCREPANCIES IDENTIFIED BY "COLOR CODE"

See Photo, Page 4

Quickening of rework or repair of printed circuit boards in the Lunar Module landing radar program at the Electronic and Space Systems facility has been made possible by a "color code" suggestion by Mrs. Frieda Hudson, inspector of LM final assemblies.

The problem was that of rapid identification of discrepancies that require immediate correction. Mrs. Hudson went a step further and devised a system of establishing quick visual identification of the type of discrepancy.

In the past, after an inspector discovered, by use of a microscope, need for correction, a tiny black "quickie" tape dot was used to identify the critical area. This color was used for all types of discrepancies.

Under Mrs. Hudson's suggestion, a variety of colors is now used—black for "lifted" pads (metal unbonded from insulating material); white for insufficient solder; yellow for excessive solder; red for excessive lead weight; and green for short lead height.

Use of such a color spectrum has hastened identification of the kind of discrepancy to minimize delay in start of rework.

TOTAL RELIABILITY IS "BUILDS BETTER" GOAL

(Continued from Page 2)

demonstrate the principle of a rollout technique for deployment of solar panel structures in space.

Ryan has built nearly 300 solar panel structures under a variety of NASA, Navy and industry contracts. Materials used have included aluminum, fiberglass and aluminum honeycomb.

"These have been projects in which there was a real need for application of 'Builds Better' principles," a Ryan spokesman said. "Close attention to over-all quality is imperative, with a minute defect rendering the entire panel ineffective. And we're proud to say that there have been zero in-flight failures on all projects."

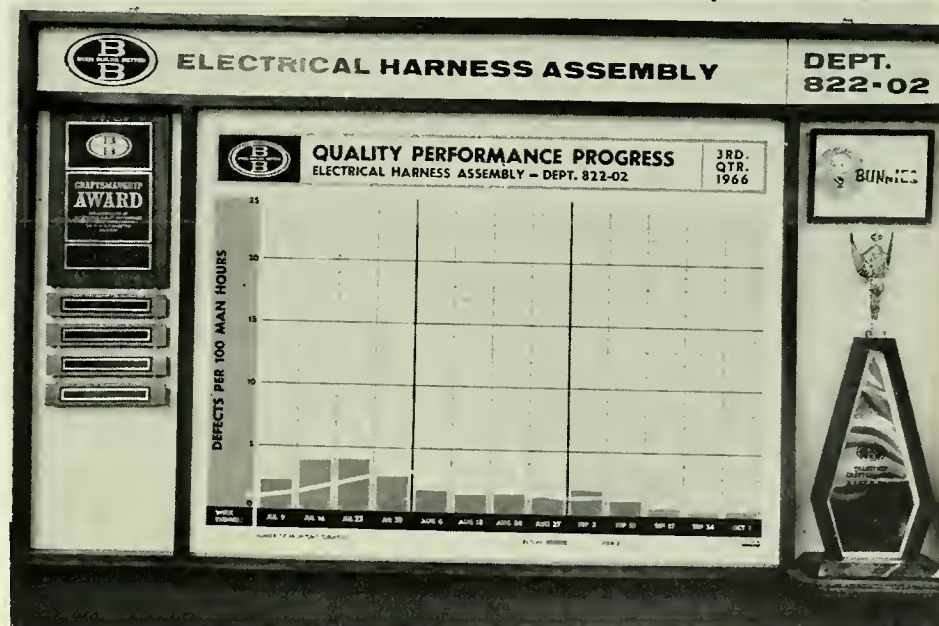
"Builds Better" Award Winner Repeats At Electronics



FIRST GROUP AT ELECTRONIC AND SPACE SYSTEMS PLANT to win monthly "Builds Better" quality performance award has done it again. Repeating its April, 1966 performance, Engineering Support, Department 896, compiled best Zero Defects record for September and earned an additional bar on its original award plaque.

Making presentation is R. G. "Dick" Wells, Manufacturing Superintendent. Steve Thomareas, Assistant Superintendent and "Builds Better" coordinator at Electronic and Space Systems, is at extreme left. Representing department are, left to right, Muriel Goold, Stella Carr, Helga Norris, Anne Hise, J. E. Menges, Lepha Hunt, Sylvia Haight, Clara Evans, Leonard Tucker, Velma Howell, Joyce Eade, and George Felix, department Foreman.

Charts Serve As Quality Performance Reminder



CONSTANT REMINDER of progress in improving quality performance aimed at elimination of defects are special displays in departments throughout all three Ryan plants. Centerpiece is a chart showing week-by-week record of defects per 100 man hours. If department has won "Builds Better" monthly or quarterly awards, plaque and trophy are mounted alongside chart, as indicated in above display at Electrical Harness Assembly, Department 822-02, showing plaque at left with monthly award metal bars suspended beneath it, and trophy at right, indicating Quarterly Craftmanship Award.

INSPECTOR PROPOSES "COLOR CODE" SYSTEM



See Story, Page 3

ALERT INSPECTOR of Lunar Module landing radar final assemblies at Electronic and Space Systems plant, Mrs. Frieda Hudson, is pictured with microscope used to detect discrepancies. Her proposal of a "color code" system to identify defects has hastened rework or repair of printed circuit boards, and is pointed to as an excellent example of "Builds Better" principles.

Space Assembly Shop (LM) Wins Quarterly Award



QUARTERLY AWARD for best "Builds Better" record in Electronic and Space Systems plant during July-August-September period was captured by Electronics Space Assembly Shop (Lunar Module), Department 896. First shift employees were represented, in photo above, by Barbara Michael receiving trophy from M. P. Kissinger, Ryan Director of Quality Assurance. At ceremonies for second shift employees, below, Helen Johnson was presented trophy by Kissinger. Coffee, "Builds Better" cake, and fruit punch were served during both presentations.



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested

Merry Christmas and Best Wishes FOR A Builds Better New Year



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 2, NO. 1

RYAN AERONAUTICAL COMPANY

DECEMBER 15, 1966

DEPT. 151 FIRST TO WIN AWARD IN MAIN PLANT

Department 151, Metal Products, holds the distinction of being the first department in the main plant to receive a monthly "Builds Better" Craftsmanship Award.

The honor of representing first shift employees of the department in presentation of the plaque and banner, went to Rudolf Friedrich, who announced his retirement almost simultaneously with the award ceremony.

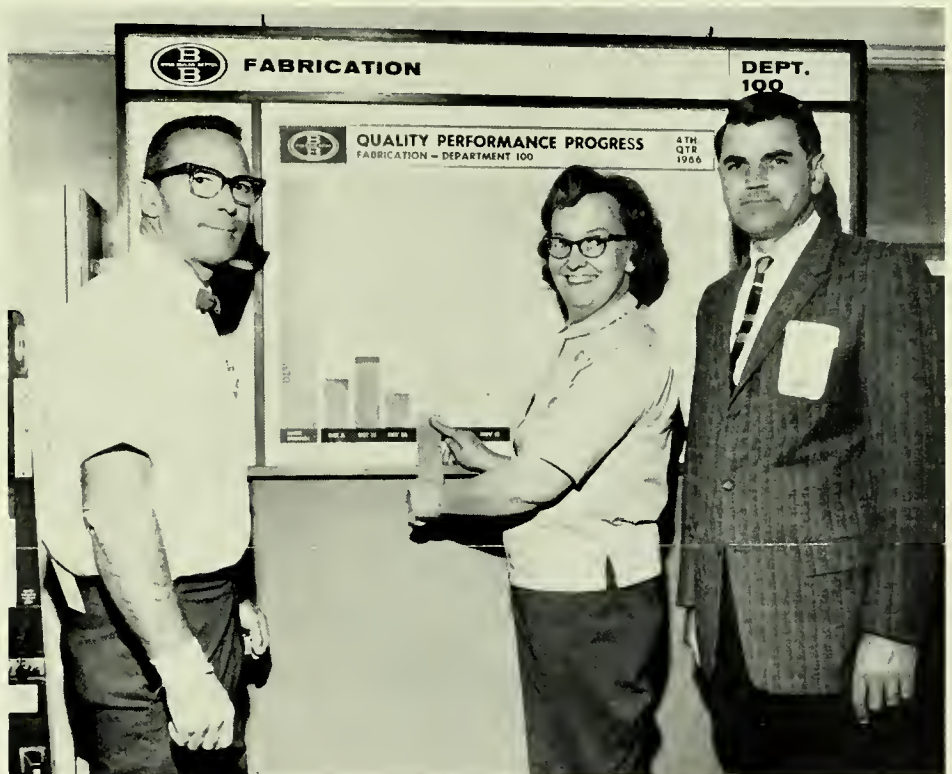
Friedrich, 63, a metalfitter, entered the retirement rolls after 27 years' service at Ryan. He was spotlighted at the presentation observance when he was handed the department "Builds Better" plaque by L. M. Limbach, Vice President-Plant Operations.

Department 151 was named as first monthly award winner in the main plant because of its significant improvement in elimination of defects. Addressing the employees, Limbach stressed the critical importance of quality workmanship in insuring a bright future for the company and continued high employment.

To maintain a high level of product reliability, each employee's work is of utmost importance, he pointed out. Top quality production constantly improves the company's position in the increasing-

(Continued on Page 3)

Quality Performance Charts Displayed In Main Plant



FIRST "BUILDS BETTER" display denoting improvement in quality performance, to be posted at main plant, is shown by Jerry Ryan, right, coordinator of the "Zero Defects" program, and E. J. Lillis, foreman, Fabrication, Department 100. Mrs. C. C. Walcott, handformer, general, a Ryan employee for nearly 16 years, plots quality performance progress for her department. Note down trend in defects. Each department plots its own progress toward "Zero Defects" based on performance figures distributed weekly by Bob Kravet, of Industrial Engineering.

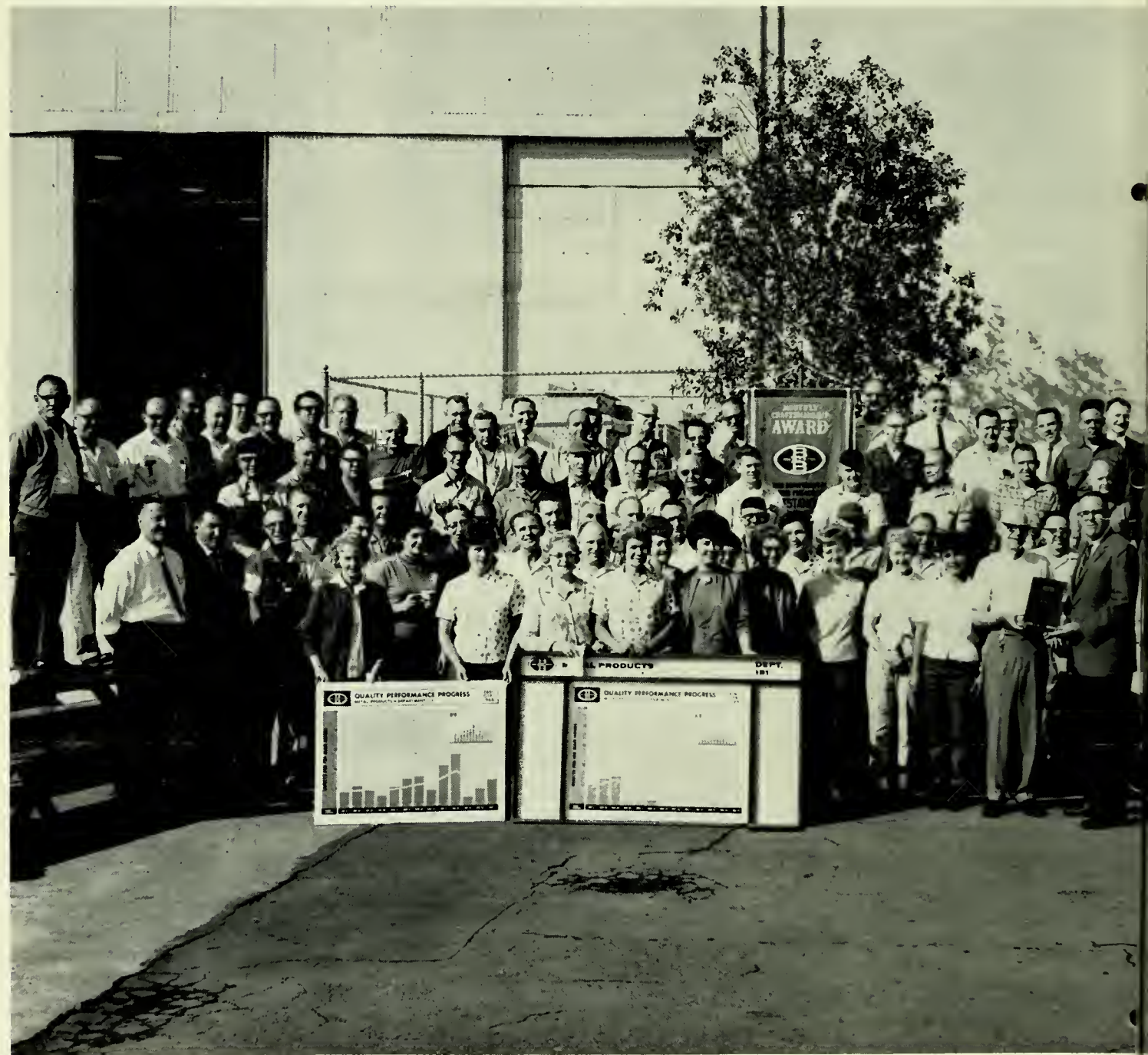
RYAN COMPLETES SURVEYOR RADAR PRODUCTION

The tenth and last radar system for the Surveyor mooncraft program was to be delivered this month on schedule to Hughes

Aircraft Company from the Ryan Electronic and Space Systems plant.

(Continued on Page 4)

"BUILDS BETTER" AWARDS LAUNCHED IN METAL PRODUCTS DEPARTMENT WINS.



FIRST DEPARTMENT IN MAIN PLANT to win monthly "Builds Better" award is Department 151, Metal Products, whose first shift tu employees in receiving plaque from L. M. Limbach, Vice President-Plant Operations, was Rudolf Friedrich, 63, metal fitter, one of service. Chart at right, in foreground, shows sharp improvement in reduction of defects during recent weeks, over previous quarter.

MAIN PLANT; FIRST HONORS



ut for presentation ceremony. Representing
t acts before retiring after 27 years' Ryan
od, as indicated in chart at left.

Employees of Department 151 Win Recognition



SECOND SHIFT EMPLOYEES in award-winning Department 151 are shown in ceremony, at which K. K. Krull, Assistant Superintendent, presented "Builds Better" plaque to Arlene Colbert, representing department. Jerry Ryan, "Builds Better" program coordinator, at right.



SHARP IMPROVEMENT in quality performance by Department 151, as shown by chart, is lauded by Jerry Ryan, "Builds Better" coordinator. At left, P. Frank Freeman, Ryan graphics consultant, who has created much of the "Builds Better" visual displays.



CRITICAL IMPORTANCE of quality in today's highly competitive condition of aerospace industry was emphasized by L. M. Limbach, Vice President-Plant Operations, in talk to Department 151 employees.

Importance of Individual's Work Emphasized

(Continued from Page 1)
ly severe competition within the aerospace industry, Limbach emphasized.

Since presentation of the award, De-

partment 151's defect level rose slightly, then experienced a substantial reduction, to a point even lower than its prize-winning level.

COMPETITION AMONG 5 TEAMS AT KEARNY MESA

Five teams with colorful nicknames are competing in a good-natured, but intensive rivalry for top honors in the "Builds Better" program at the Kearny Mesa plant.

Because most of the hourly employees at that plant are women, the teams sport such titles as "Starlets," "Bunnies," "Debs," "Go-Go Girls," and "Jet Set."

Since inauguration of the "Builds Better" program at Kearny Mesa in mid-1965, over-all quality performance has

improved considerably, according to Jerry Ryan, program coordinator.

Large displays adjacent to each of these five work areas show the department's current quality trend and awards won in the past. And in a central location are smaller charts showing current quarter quality trends, and directly below, the previous quarterly trend for each team, permitting an instant comparison of their performances.

Foremen of the departments are:

"Starlets," Department 822-01, M. L. Thomas.

"Bunnies," Department 822-02, Ray Cleveland.

"Debs," Department 822-03, E. Hall.

"Go-Go Girls," Department 822-04, R. Simmons.

"Jet Set," Department 822-05, Harry Wisner.

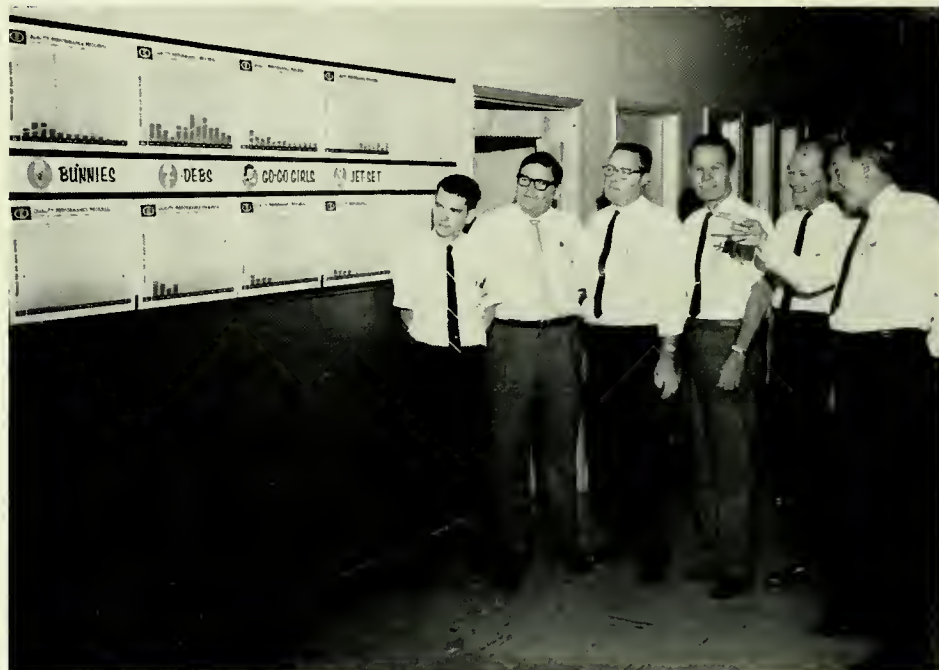
Slogan Stresses Need For Doing Job Right

"Our sons may be the Astronauts of Tomorrow; their lives will depend upon our skilled hands and our ability to do a job right Today."

This slogan, created by Theresa S. Esguerra, inspector, Department 873, Electronic and Space Systems plant, in many ways epitomizes the reasons why employees in the aerospace industry should strive for perfection in workmanship.

Mrs. Esguerra, whose three children include a 9-year old boy with ambitions to enter the space program, conceived the slogan during her inspection work on Lunar Module landing radar components in the final assembly area of the "clean room."

Foremen Debate Merits of Their Kearny Mesa Teams



MERITS OF THEIR RESPECTIVE TEAMS are debated by foreman at Kearny Mesa plant, shown with Jack H. Eddy, General Foreman, at right, pointing to performance charts of "Starlets," "Bunnies," "Debs," "Go-Go Girls," and "Jet Set." Foremen are, left to right, M. L. Thomas, "Starlets;" Ray Cleveland, "Bunnies;" E. Hall, "Debs;" R. Simmons, "Go-Go Girls;" and Harry Wisner, "Jet Set."

Dept. 822-01 Wins Second Award in Three Months



MONTHLY "BUILDS BETTER" AWARD for October Kearny Mesa plant was won by Department 822-01, Electronics Assembly, which also won the August honors. Paul Vissat, Superintendent, Manufacturing, presents additional bar for plaque to Wanda L. Bush on behalf of employees. Foreman of this group is M. L. Thomas, and assistant foremen are D. Geissler and L. Wise.

RYAN COMPLETES SURVEYOR RADAR PRODUCTION

(Continued from Page 1)

The delivery marks the end of a 5-year, \$10 million development and production program at Ryan. However, Ryan's work with Hughes will continue through com-

pletion of the NASA Surveyor program to facilitate any engineering support required.

"The successful completion of this program is the foundation upon which the

(Continued on Page 6)

ADDITIONAL INCENTIVE NOW PROVIDED

A double incentive is now provided in departments in all three Ryan plants in the "Builds Better" monthly competition.

In addition to the recognition afforded the winning departments by presentation of plaques, trophies and banners, each employee will be eligible for a prize to be awarded in a drawing.

The most recent such prizes were turkeys, averaging 20 pounds in weight, received in time for the Thanksgiving holidays.

Three of the succulent birds were won by employees of Department 151, main plant — J. V. Tennant, sampler, J. K. Weyer, master mechanic, and M. H. Olds, assembler. Their service records at Ryan range from four months for Tennant to 10 years for Olds, to 28 years for Weyer.

Two employees of Department 822-01, Electronics Assembly, Kearny Mesa plant, took turkeys home after the "Builds Better" drawing in that plant — Evelyn Hay and Janet C. Ayers.

Velma Howell, of Department 896, Engineering Support, Electronic and Space Systems plant, won the drawing among that group. Strictly by coincidence, Velma had been selected to perform the drawing, and she plucked her own name from the pile — without looking.

"Builds Better" winning departments during the pre-Christmas period will have chances at festively decorated large size Mission Pak glazed fruit packages.



TURKEY WINNERS in recent drawings among top "Builds Better" departments are pictured above. In photo at left, J. V. Tennant, J. K. Weyer and M. H. Olds receive Thanksgiving birds from J. E. Whitten, assistant foreman, Department 151, main plant, at left, and Mike Waples, foreman, at right. In center photo, Evelyn Hay and Janet C. Ayers are presented their prizes by M. L. Thomas, foreman, Department 822-01, Electronics Assembly, Kearny Mesa. And in photo at right, Velma Howell takes her "trophy" from George Felix, foreman, Department 896, Engineering Support, Electronic and Space Systems plant.

NEW MACHINE TOOLS ENHANCE QUALITY

The quality workmanship "Zero Defects" goal of the Ryan "Builds Better" program will be more readily achieved as results of a major expansion of giant machine tool facilities.

Five huge milling and drilling machines will have been installed by early 1967 in

the machine shop of the main plant.

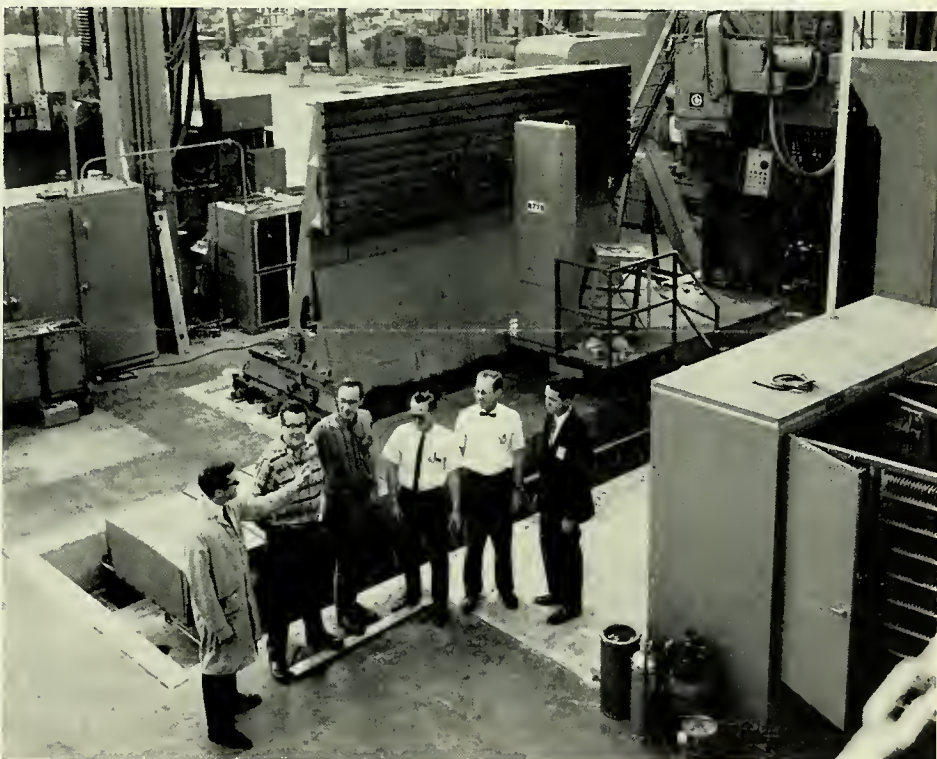
Two are already in place and operating. One is a Giddings & Lewis single spindle, five-axis milling machine which weighs more than 200,000 pounds. The other is a Pratt & Whitney Tape-O-Matic drilling machine.

Extreme accuracy was necessary in the installation, with perfect alignment required to insure production reliability.

Due within the next few weeks are two H & H Wilson milling machines and a Milwaukee-matic milling machine. All five machines are numerically tape-controlled, providing exact repeatability, an asset in the quest for "Zero Defects."

The new machines will help relieve the

(Continued on Page 6)



"BUILDS BETTER" GETS BOOST AT RYAN with installation in main plant machine shop of giant new Giddings & Lewis numerically tape-controlled milling machine, shown with control unit in foreground. Left to right, Bob Elliott, Giddings & Lewis service engineer; George W. Olson, Ryan machine operator; William J. Bonventri, machine operator; George Pelfry, assistant foreman, Department 130; Oscar H. Nelson, foreman; and Harley Elwell, representative of Bendix, which provides machine controls.

'Builds Better' 31 Years



FOR 31 YEARS, Carl "Ace" Nesbitt, one of Ryan's oldest employees in point of service, has applied "Builds Better" principles where they really count — in the maintenance as well as construction of Ryan-built and Ryan-owned planes. He's one of the capable crew that maintains all Ryan executive aircraft, including the six-place Beechcraft he is inspecting.

NEW MACHINE TOOLS ENHANCE QUALITY

(Continued from Page 5)

heavy work load of other equipment, which will continue to operate to maximum capacity.

A fascinating phase of the operation is the production of the tape which automatically controls the machines. A part programmer analyzes, in mathematical terms, the engineering concept drawing of the part to be machined or drilled. He writes this into computer "language," and this "manuscript" is key-punched on IBM cards, which are submitted to the IBM

Dept. 896, Engineering Support, Honored Third Time



FOR THE THIRD TIME THIS YEAR, Department 896, Engineering Support, won the Electronic and Space Systems plant monthly "Builds Better" award. The October prize followed similar honors last September and April. Shown receiving additional rung on craftsmanship plaque from Robert H. Guyer, Factory Manager, is L. Tucker. George Felix, foreman, is at right, and R. G. "Dick" Wells, Manufacturing Superintendent, is at left in photo.

RYAN COMPLETES SURVEYOR RADAR PRODUCTION

(Continued from Page 4)

company is building an unrivalled capability in space radars for the coming decades," Robert C. Jackson, company president said.

"Surveyor led us into the Lunar Module

704 computer for processing.

The computer produces a punched tape in language the machine tool understands. When the three machines on order are delivered, Ryan will have a total of 9 numerically tape-controlled machines.

landing radar for the manned exploration of the moon in Project Apollo, and we are now anticipating a role in NASA's Project Voyager unmanned vehicles to Mars and Venus during the 1970's."

"Everyone in the company involved in the design and production of the Surveyor radar system is to be commended for the marvelous accomplishment they have scored in meeting delivery dates."

Of the 10 space flight systems, seven are for actual moon-landing. Two are spares and one is a thermal test model.



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 2, NO. 2

RYAN AERONAUTICAL COMPANY

JANUARY 23, 1967

DEPT. 822-02 WINS AWARD FOR 6TH TIME

Ryan's most honored department in the "Builds Better" competition to assure quality workmanship, Department 822-02, Electrical Harness Assembly, has done it again.

For the sixth time since the Zero Defects program was launched at Ryan, this department, nicknamed "Bunnies," has

earned a monthly award for achieving a remarkably low volume of defects.

In addition to this recognition, the department, whose foreman is Ray Cleveland, received the quarterly award for the best record during the first three months of 1966, and the first and only special award made to date—the latter for an outstanding sustained low defects record achieved in mid-1966. As a result of the special award, Department 822-02 has possession of the original "Zero Defects" pennant presented employees of the Kearny Mesa

(Continued on Page 2)

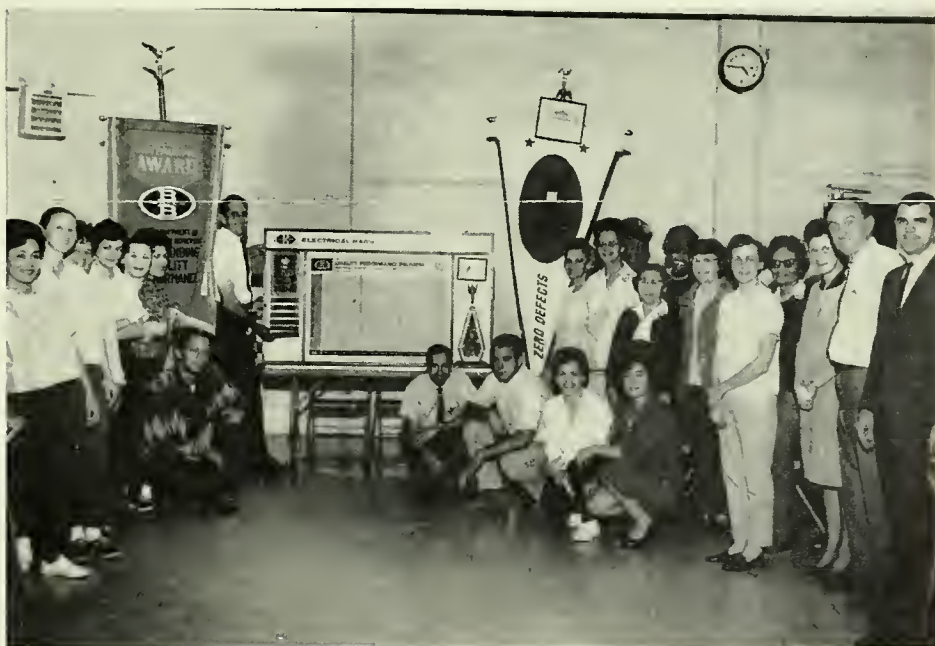


BONUS AWARDS went to lucky employees of Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, which recently achieved monthly top quality workmanship mark for the sixth time. Glazed fruit packs were won in drawing within department receiving "Builds Better" honors. Paul Vissat, Superintendent of Manufacturing, presented prizes to, left to right, Reba Street and Alberta F. Michaelson, of the first shift. See Page 2 for photo of second shift winner.

Most Honored Department Does It Again



SIXTH MONTHLY CRAFTSMANSHIP AWARD was presented recently to Ryan's most honored group in the "Builds Better" competition. First shift of Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, proudly displays chart showing extremely low level of defects. Kneeling at left is Paul Vissat, Superintendent of Manufacturing, Kearny Mesa, who attaches new rung to plaque denoting monthly awards.



TRIBUTE IS PAID to second shift, Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, for its contribution to quality workmanship performance that earned the department its sixth monthly award. Standing at left of performance progress chart is Paul Vissat, Superintendent of Manufacturing. At right in photo are Jack H. Eddy, General Foreman; and Jerry Ryan, "Zero Defects" program coordinator.

SURVEYOR RADAR DELIVERY ENDS 5-YR. PROGRAM

Recent delivery of the tenth and last spaceflight model of the Surveyor Landing Radar Altimeter and Doppler Velocity Sensor to the prime contractor, Hughes Aircraft Co., concluded a five-year development and production program marked by a high level of quality performance.

Typical of the reliability Ryan customers came to expect in this program was the fact that the final delivery was five days ahead of schedule, the third consecutive ahead-of-schedule delivery.

Assurance that every one of the myriad
(Continued on Page 3)

DEPT. 822-02 WINS AWARD FOR 6TH TIME

(Continued from Page 1)

plant when the "Builds Better" program was launched.

The department's quarterly award also was the first to be presented in any of the three Ryan plants, recognizing the best error rate improvement for three consecutive months last year.

Due to the critical nature of the work in which the department is engaged, all employees are cognizant of the need for perfection in every operation.



SECOND SHIFT WINNER of glazed fruit pack in drawing among employees of Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, was Dorothy Ventura, shown receiving prize from Gabriel Baccash, at left, assistant foreman, and Jack H. Eddy, General Foreman.

Lunar Module Assembly Cited For Quality Workmanship



"BUILDS BETTER" MONTHLY AWARD in Electronic and Space Systems plant was presented recently to Department 896 (Lunar Module Cordwood Assembly), for outstanding quality workmanship in reducing defects.

First shift employees were represented by Martha Gutierrez, in ceremony at which bar representing second time monthly award has been made was affixed to plaque by Robert Guyer, Manufacturing Manager.

Athanasia "Suzie" Gotses accepted award from Steve Thomareas, Superintendent, Electronics Manufacturing, on behalf of second shift workers. Helen Lopez, winner of glazed fruit gift package in drawing within department, is shown holding her prize.



DEPT. 151 WINS 'BB' AWARD 2ND STRAIGHT MONTH

For the second consecutive month, Department 151, Metal Products, has won the "Builds Better" Craftsmanship Award for continued significant improvement in elimination of defects.

Department 151 was the first in the San Diego main plant to receive this honor. At the initial ceremony in which the "Builds Better" plaque and banner were presented, L. M. Limbach, Ryan

Vice President-Plant Operations, stressed the critical importance of quality workmanship in today's highly competitive aerospace industry.

W. J. Wiley, Director of Plant Operations, reemphasized that high employment can be insured by turning out reliable products made possible by individual striving for perfection.



WINNERS of glazed fruit gift packages in drawing among employees of Department 151 recently were, left to right, Holly C. Ruhnow, aircraft assembler, and C. J. Quinn, chassis assembler, shown with Jerry Ryan, coordinator of "Zero Defects" program. Not available for photo was another winner, Wallace Adams, machine parts inspector.

IMPORTANCE OF QUALITY STRESSED

The importance of paying close attention to individual workmanship was stressed by an Air Force officer at a Ryan-coordinated dinner meeting of the San

(Continued on Page 4)

Metal Products Department Honored Again



SECOND CONSECUTIVE MONTHLY "BUILDS BETTER" AWARD was presented recently to Department 151, Metal Products, main plant. First shift employees, shown above, turned out for refreshments and ceremony at which W. J. Wiley, Director of Plant Operations, added a second bar to Zero Defects plaque held by Fred Simonides, representing co-workers.

In photo below, second shift employees are shown with department's quality performance progress chart. Kneeling are O. W. Kupilik, Manager of Fabrication, at left, and Jerry Ryan, coordinator of the "Zero Defects" program. Standing, at right, Ray Jaeger, second shift assistant foreman.



Surveyor Radar Delivery Ends 5-Year Program

(Continued from Page 2)
components in the landing radar was perfectly fabricated and installed paid off with the spectacular soft landing of a Surveyor spacecraft on the moon last June to explore its surface as a preliminary to later Apollo manned flights.

The Ryan landing radar is the key to the

soft landing. It controls Surveyor's descent as it decelerates rapidly from 6,000 miles an hour.

Further Surveyor flights are planned by the National Aeronautics and Space Administration, and Ryan will continue to stand by with any engineering support required.

DEFECTS CUT DRASTICALLY BY DEPARTMENT 140

A dramatic example of how defects can be sharply reduced when a concentrated effort is made was provided by Department 140, Processing and Paint.

This is one of the critical manufacturing activities in the plant, handling thousands of detail parts for virtually every product in fabrication. Department 140 performs processing, painting and sealing, and vacuum metalizing, with a large share of its performance devoted to the Firebee

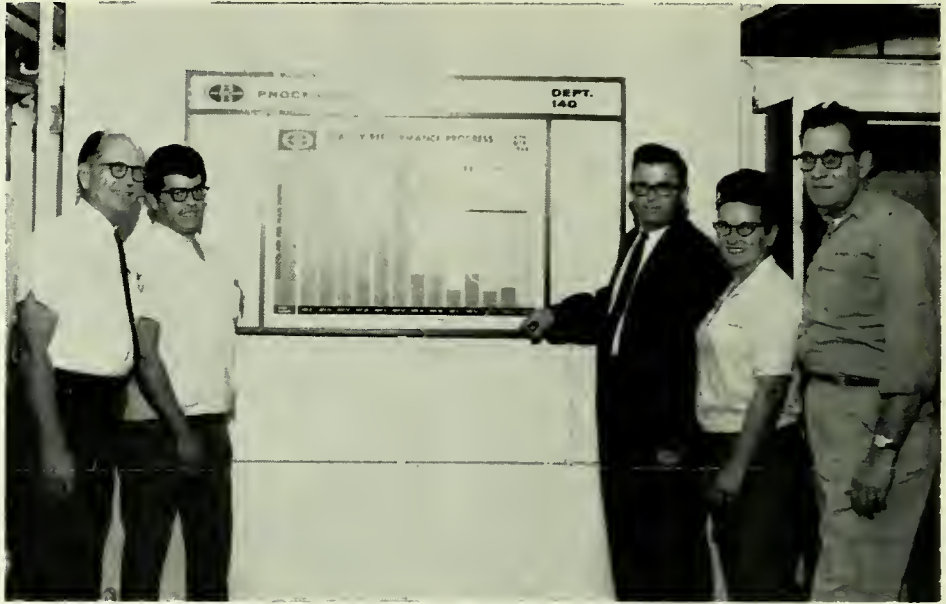
jet target drone production.

"The importance of Zero Defects was impressed on all employees in regular sessions, so that each person began aiming at an individual goal of perfection," Sam Davis, General Foreman, explained.

"We all became aware of what had to be done, and accomplished it by teamwork."

Within a six-week period, Department 140's Quality Performance Progress chart

Processing Department Achieves Zero Defects



SHARP DROP IN DEFECTS to zero level was effected recently by Department 140, Processing and Paint. Displaying chart which shows dramatic reduction in errors are, left to right, Sam Davis, General Foreman; R. E. Blanco, sealer tester, general; O. O. Baugher, Assistant Foreman; Mary Drabicky, chem mill scribe; and A. R. Torrescano, painter general.

showed a spectacular plunge in defects. At one point in this remarkable improve-

ment, not a single defect was recorded during an entire week.

AIR FORCE OFFICER CITES IMPORTANCE OF QUALITY WORKMANSHIP

(Continued from Page 3)

Diego chapter, American Society For Quality Control.

Capt. David Golob, Chief of the Engineering Branch, the Air Force Logistics Command Liaison Office at the Ryan plant,



IMPORTANCE OF TOP QUALITY workmanship was stressed to members of the San Diego chapter, American Society for Quality Control, in last month's dinner meeting, by Capt. David Golob, of Air Force Logistics Command office at the Ryan plant, shown seated with his wife. He was introduced by M. J. Martin, Manager of Quality Assurance, Ryan San Diego plant.

speaking on "What the User Thinks of Quality," pointed out that the grounding of military planes due to deficiencies is often traceable to failure to achieve zero defects in production.

Top quality must be attained by the producer to provide for full reliability in the field, he emphasized. Such quality not only will assure maximum performance in support of the defense effort, but will pro-

vide economic benefits to the manufacturer and lowest possible cost to the government, Capt. Golob said.

Approximately 175 from industrial plants throughout the San Diego metropolitan area, and the North Island Naval Air Station, attended the dinner at the Bronze Room, La Mesa. M. J. Martin, Manager of Quality Assurance, San Diego plant, introduced Capt. Golob.

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



BUILDS BETTER BULLETIN

RYAN BUILDS BETTER WITH ZERO DEFECTS

VOL. 2, NO. 3

RYAN AERONAUTICAL COMPANY

FEBRUARY 20, 1967

DEPT. 140 NETS 'ZERO DEFECTS,' WINS AWARD

After a spectacular drop to a Zero Defects level recently, Department 140, Processing and Paint, maintained its remarkable performance long enough to earn its first monthly "Builds Better" Craftsmanship Award for top quality workmanship.

With thousands of detail parts flowing through Department 140 for virtually every product in fabrication, the necessity of eliminating errors is vital during processing, painting, sealing, and vacuum metalizing operations. A large volume of Department 140's work is performed for Ryan's major assembly line activity, on the Firebee jet target drone.

"Teamwork by individual employees who assumed the responsibility of seeking perfection in workmanship made this great record possible," Sam Davis, General Foreman, said. "Everyone realized what had to be done, and was determined to bring defects down to the zero level."

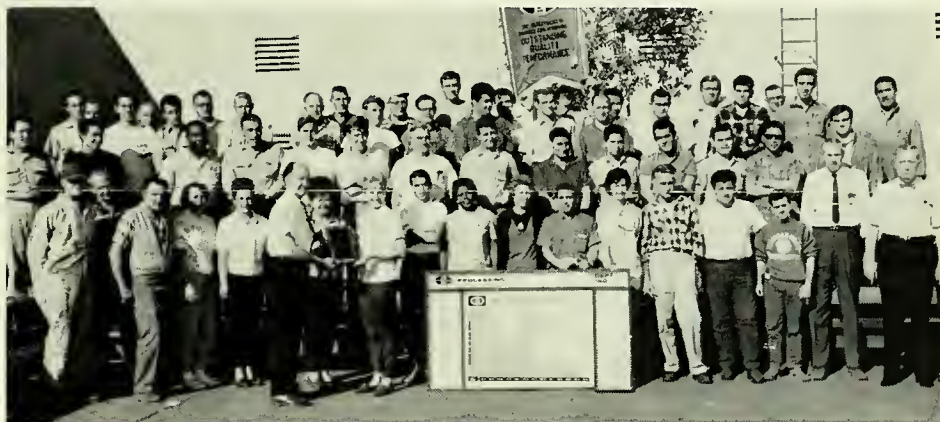
After a dramatic six-week decrease in the number of errors, the Zero Defects "floor" was reached and maintained. The result was inevitable—award of the coveted plaque and banner denoting the best monthly "Builds Better" performance of any department in the main plant.

RECORD SET IN DEPARTMENT 822-02

A record for completion of relay recovery boxes without a single error has been achieved in Department 822-02, Electrical Harness Assembly, Kearny Mesa plant.

Fifty-two such boxes, used in the electronic equipment of the remote-controlled

Processing And Paint Dept. Wins First Monthly Award



"ZERO DEFECTS" PERFORMANCE won for Department 140, Processing and Paint, recent monthly "Builds Better" award. First shift employees were represented by Rose McElligott, above, in presentation of plaque by Sam Davis, General Foreman. Second shift employees, below, received honors from H. E. Dukes, Manager of Assembly. (See Photo, Page 2).



Firebee jet target drone, were wired without a defect by a team of electronic assemblers consisting of Betty Flint and Barbara Varela, first shift; and Martha Tanida, second shift. Significance of this remarkable performance is highlighted by the fact that each box has 350 soldering

connections. Thus, 18,200 such connections were made perfectly.

"It was a great example of the everyday teamwork required in this project," Ray Cleveland, General Foreman, declared.

Department 822-02, which does all wiring
(Continued on Page 2)

RECORD SET IN WIRING OF RELAY BOXES

(Continued from Page 1)

ing of electronic assemblies, is Ryan's "most honored" department in the year-round "Builds Better" competition. It has won the monthly quality workmanship award six times for achieving a low volume

of defects. In addition, it received the quarterly award for the best record at the Kearny Mesa plant during the first three months of 1966, and the first and only special award made to date, for an outstanding sustained low defects record in mid-1966.

His Idea Effects Savings



SUBSTANTIAL SAVINGS are effected by procuring small flat precision sheet metal pieces, from an outside source specializing in such production. J. E. Shinkle, production processor, Electronic and Space Systems plant, who proposed the system, displays the different sizes of metal pieces that can be obtained in this manner for electronic assemblies.

Employee Exemplifies 'Builds Better' Spirit

The "Builds Better" spirit was exemplified recently by J. E. Shinkle, production processor, Department 895, Electronic and Space Systems plant, with a pro-

All-Time "Zero Defects" Record Set In Dept. 822-02



ALL-TIME "ZERO DEFECTS" RECORD has been set by Department 822-02, Electrical Harness Assembly, in completion of 52 relay recovery boxes without a single error, involving more than 18,000 perfect soldering connections. Receiving congratulations of Jim Haag, assistant foreman, at left, and Ed Carson, at right, foreman, are Betty Flint and Barbara Varela, shown with 52nd unit. Not in photo is second shift member of this "team," Martha Tanida.

Department 140 Employees Win Transistor Radios



TRANSISTOR RADIOS were won in drawing among Department 140 employees by, left to right, Tony Martinez, M. E. Montez, Mike Oliveira, Tony Cavigliano, and Ann Kolish, all of the first shift, shown with Jerry Ryan, "Zero Defects" program coordinator. Second shift winner was Joe B. Trujillo. (See Photo, Page 1).

posal that is effecting substantial savings. He developed a system of procuring small flat precision sheet metal pieces

from an outside source that specialized in such production, hence is able to pro-

(Continued on Page 3)

DEPTS. 154, 156 EARN SPECIAL RECOGNITION

Deserving of special recognition for maintaining consistently low defect levels are Departments 154, Lot Order Sub Assembly, and Department 156, Wave Guide, in the main plant.

Detail work of an extremely complex assembly nature is performed by Department 154, which builds sub assemblies for all Firebee jet target drones.

Although statistical chances for error are great, close attention to workmanship has enabled this department to show a constantly improving performance record. The number of defects has sharply declined in recent months, recently reaching a "Zero Defects" level that has benefited the entire Firebee production program.

Gordon L. Longmire is foreman, and Tommie B. Shows and Joe Kent, Sr. are the assistant foremen.

Department 156's sustained low defects has been a major contributor to the prize-winning performance of Department 151, Metal Products, which was awarded the top monthly recognition in the "Builds Better" competition twice consecutively, last October and November, in the main plant. Department 151 was the first main plant activity to win a monthly award.

Department 151's light weight products include such a variety as wave guides for the Lunar Module and Surveyor radar landing systems, automatic navigation antennas, and solar panels. It also performs electrical discharge machining—removal of metal by electrical discharge—among other functions.

John Miller, foreman, reports that the employees in this group have performed without a single rejection over a three-month period—"Zero Defects" during November, December and January.

'Builds Better' Spirit Exemplified By Ryanite

(Continued from Page 2)

duce at low cost with no sacrifice of quality.

Such procurement frees for other work

Department 822-03, Magnetic Assembly, Wins Honors



KEARNY MESA PLANT "BUILDS BETTER" MONTHLY AWARD WINNER for December was Department 822-03, Magnetic Assembly. Robert H. Guyer, Manufacturing Manager, presents plaque to Jo Vesco, representing day shift. To right of Guyer are Paul L. Vissat, Superintendent, and Ray Cleveland, General Foreman. To left of Jo Vesco is Earle Hall, Foreman.



WINNERS OF TRANSISTOR RADIOS in drawing held during "Builds Better" award ceremonies honoring Department 822-03, Magnetic Assembly were, Hazel Kelley and Margaret Bunnell. Earle Hall, Foreman, holds radio won by Jim Buckles of second shift.

Ryan's own plant facilities that would otherwise have been utilized for fabrication of these units.

Savings of up to 800 percent are now possible, according to R. G. Wells, Manufacturing Superintendent. The metal pieces, of various sizes, are used in electronic assemblies.

Shinkle diagnosed the problem, and after considerable research, located the supplier capable of meeting Ryan's production requirements. Possibility of ap-

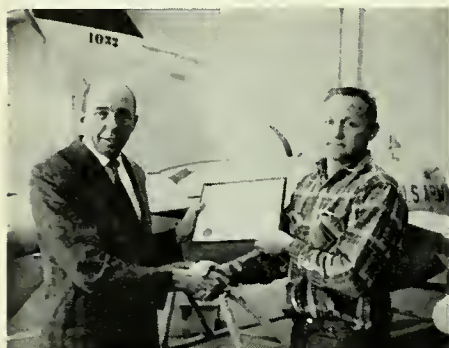
Conceives Slogan



SLOGAN PROPOSED by Theresa S. Esguerra, shown on job as inspector in Electronic and Space Systems plant, summarizes the need for perfection in workmanship. During her work on Lunar Module landing radar components, Mrs. Esguerra, mother of three, including a 9-year-old boy with aerospace ambitions, suggested Ryanites be guided by this thought: "Our sons may be the Astronauts of Tomorrow; their lives will depend upon our skilled hands and our ability to do a job right Today."

plying this system to similar parts being fabricated elsewhere at Ryan is being studied.

Field Crew Men Honored



RYAN FIELD CREW MEMBERS honored for superior workmanship during months of November and December are shown receiving framed certificates indicating best individual performances. J. O. Rathgeber, Manager of the Ryan crew at the McGregor Range, N.M., makes presentation to R. B. Steinauer, above, Target Systems Mechanic, and to R. G. Barela, below, Target Systems Technician.



Crews 'Ground-fly' Every Firebee Drone

The men who "ground-fly" every Firebee jet target drone as it leaves the assembly line report the number of defects they are detecting has dropped drastically.

"Over the past three months, there have been virtually no errors detected on our checkout equipment, which means that assemblers are doing a near-perfect job," Max Porter, inspection supervisor, said.

The three-man checkout crew perform a complete functional test of every Firebee as they test all systems to make sure the "bird" is ready to fly on target missions.

Bob Stowers and Al Winters comprise the test cell personnel on the first shift, and Howard Blackburn continues the work on the second shift.

Dept. 895, Model Shop, First Time 'BB' Winner



FIRST TIME WINNERS of monthly "Builds Better" Craftsmanship Award, employees in Department 895, Model Shop, Electronic and Space Systems plant, are congratulated by Robert H. Guyer, Manufacturing Manager. Department received plaque and banner, and five lucky employees won transistor radios in drawing, a new feature providing added incentive in Zero Defects program. They were R. D. Martin, Pete Ryf, J. Atanasoff, and Jeannie Jensen, first shift; and Joe Rockstroh, second shift.



HONORS WERE SHARED by second shift employees of Department 895, Model Shop, as Steve Thomareas, Manufacturing Superintendent, presents "Builds Better" plaque to Dan W. Babcock, on behalf of co-workers. Charles Henry, Manager of Quality Assurance, Electronic and Space Systems Plant, looks on approvingly at left. The department performs a wide variety of activities, including machining for electronic prototype and research and development work; manufacturing of printed circuit boards of all types, and silk screening.

RYAN AERONAUTICAL COMPANY
P.O. Box 311
San Diego, California 92112

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

MARCH BULLETIN

VOL. 2, NO. 4

RYAN AERONAUTICAL COMPANY

MARCH 20, 1967

LARGEST DEPT. IN MAIN PLANT WINS HONORS

See Photos, Pages 2 and 3

Two firsts have been achieved by the largest department in the main plant at Lindbergh Field, Department 130, Machine Shop.

The 185 employees in the department—plus 13 inspectors and 5 in factory supply activities assigned to the unit—earned their first “Builds Better” honors, and it was a big one, the first quarterly award won in the main plant.

Department 130 was cited for the most steady improvement and most consistent down trend in defects of any department with which it was competing during the last three months of 1966. The large volume of work that makes this department one of the few operating around the clock on all three shifts makes its feat even more remarkable.

In special appearances before each of the three shifts, W. J. “Bill” Wiley, Vice President-Plant Operations, recalled that he began his aerospace industry career in a machine shop, where the requirement of perfection in craftsmanship is constantly emphasized.

“The most important thing Ryan can offer is the quality of its products,” he

(Continued on Page 4)

DEPT. 154 WINS 1st MONTHLY AWARD

See Photo, Page 5

Department 154, Lot Order Sub Assembly, joined the “Builds Better” parade of winners in the main plant by earning its first monthly award for outstanding performance during January.

Its achievement was highlighted by attainment of 100 percent “Zero Defects” for two consecutive weeks of that month.

Department 154 performs work on the

Dept. 154 Gains Recognition For Outstanding Effort



TWO CONSECUTIVE WEEKS OF “ZERO DEFECTS” helped Department 154 win monthly “Builds Better” award for January in main plant. Alice Buckman receives plaque on behalf of co-workers from Howard Engler, Director, Manufacturing.



WINNERS OF “BUILDS BETTER” ASH TRAYS in drawing among Department 154 employees were, starting from third on left, Alita Ramirez, Alma Wright, Fran La Rue, Lila Cook, Alta Aldridge, Paul Moon, Julia Dietrich, Mark Meyers, and Vera Feldman. At left in photo are Bob Laesch, General Foreman, and Joe Kent, Assistant Foreman.

Model 124A, Model 147 and Model 166.

Lucky employees within the department who won the drawings for smoked glass “Builds Better” ash trays were Mark

Meyer, Fran La Rue, V. L. Feldman, Paul Moon, Alma Wright, F. P. Tiffany, Lila Cook, A. V. Ramirez, Alta Aldridge, and Julia Dietrich.

MACHINE SHOP, LARGEST DEPARTMENT PLANT, WINS QUARTERLY 'BUILDS BETTER'



FIRST QUARTERLY "BUILDS BETTER" AWARD IN MAIN PLANT was earned by Department 130, Machine Shop, which took the award in the continuing "Zero Defects" competition. First shift employees are shown above with "Zero Defects" Banner and W. J. Balistreri. Second shift workers are pictured in photo, left below, with Sarah O. Proud receiving trophy from W. J. Balistreri. Third shift workers are shown in photo, right below.



IT IN MAIN TER' AWARD



tally also made this big prize its first
"Builds Better" trophy, held by J. S.
Vice President-Plant Operations. Third



Honor Roll Of Employees In Department 130

Following is the "honor roll" of employees in Department 130, who earned the first quarterly "Builds Better" award ever presented in the main plant:

FIRST SHIFT

SUPERVISION—L. R. Barrett, General Foreman; L. S. Adams, O. Nelson, Foremen; K. E. Stevens, G. W. Pelfrey, H. W. Nordenberg, Assistant Foremen.

* * *

G. DeLaMater, C. E. Adams, R. Evey, J. D. Lloyd, A. L. Fleet, M. O. Tooley, G. S. McCoy, B. A. Kaishas, H. R. Beird, W. B. Glaze, A. A. Gora, G. W. Keller, R. Cross, E. A. Small, F. J. Burkhart, M. C. DePuydt, A. H. Kaufman, J. E. Caster.

T. Tabor, R. Creley, L. Young, R. W. Kehrenberg, M. Fortenberry, R. L. Rodriguez, C. F. Timm, W. F. Kumpf, H. L. Davis, A. L. Wenger, C. J. Melonopoulos, G. W. Olsen, N. Vigil, H. Plumer, A. Chavez, P. J. Horan, E. Bledsoe, D. W. Hendricks.

A. J. France, H. H. Yamashita, H. C. Lynn, W. J. Driscoll, F. E. Buck, C. A. Butler, A. Uliks, V. A. Haas, J. P. Weisenberger, L. R. Saurini, W. E. Willis, D. F. Hurlbert, S. McGinley, W. J. Bonventre, J. H. Gerrior, J. Zaranka, L. Auker, R. L. Hollis.

D. Lance, T. Clifford, S. G. Jackson, J. A. Snodgrass, C. W. Ankenney, M. J. Howell, N. F. Brown, M. E. Simonides, J. S. Balistreri, J. J. Kessler, W. McClure, W. L. Hammond, J. McDonald, D. S. Murakami, D. G. Walker, G. J. Kemen, W. B. Deese, R. R. Laymon, H. McGraw, D. M. Flores, J. H. Legler, A. L. Balistreri, A. Gentles.

SECOND SHIFT

SUPERVISION — A. Ghianni, General Foreman; W. J. Muusse, Foreman; E. A. Casner, W. H. Skipworth, Assistant Foremen.

* * *

J. F. Butler, M. Ruzich, H. W. Devoe, F. Yager, L. F. Atwood, H. W. Shine, S. O. Proud, C. E. Welt, I. D. Jones, G. N. Cottrill, C. R. Fish, K. H. Treaster, J. A. Confort, D. R. Porterfield, W. White, E. J. Vargas, I. L. Mills, L. R. Dillingham.

R. G. Vaughan, C. W. Harris, B. J. Zalewski, J. Graham, B. Steuermann, R. D. Lack, C. L. Breehne, J. A. McKnight, A. L. Wilson, A. S. Fredericks, T. F. Kulis, H. E. Graham, B. A. Atkins, L. F. Polando, F. A. Lublow, F. G. Duellman, C. D. Lawson, J. Ashbourne.

R. B. Maringer, R. Kurianski, H. K. Zembruski, N. M. Plastina, M. G. Metzger,

Addresses Employees



DEPARTMENT 130 THIRD SHIFT employees are lauded by W. J. Wiley, Vice President-Plant Operations, for their contribution toward "Zero Defects" performance that won first quarterly award in San Diego main plant.

Individual Prize



HANDSOME CALENDAR and note pad was presented each employee of Department 130 as personal recognition for "Builds Better" performance.

'Builds Better' Cake



REFRESHMENTS at Department 130 award ceremonies included this handsomely decorated "Builds Better" cake.

H. R. Hughes, L. R. Barrett, E. D. Jones, R. E. Oberdorf, W. J. Brunmeir, W. E. Sylvester, H. J. Freeman, M. J. Rott, D.

(Continued on Page 5)

PERFORMANCE OF DEPT. 822-05 EARNS TRIBUTE

The "Builds Better" monthly award for January in the Kearny Mesa plant went to Department 822-05, Returned Parts-Mod Assembly, whose performance won special tribute from supervision.

In a talk to the employees at the award presentation ceremony last month, Paul L. Vissat, Superintendent, Manufacturing, pointed out that this department has a

particularly difficult task in striving for the program's "Zero Defects" objective.

Parts that are damaged, either in shipment or in use, are returned to Department 822-05 for inspection, investigation of the problem and repair for return to the customer in the equivalent of a new condition.

"Every part constitutes a separate problem," Vissat said. "The fact that there is no consistency in the type of repairs that must be accomplished makes your job especially difficult, and it took extra effort to achieve the "Builds Better" record.

'ZERO DEFECTS' IN IMPORTANT PROJECT

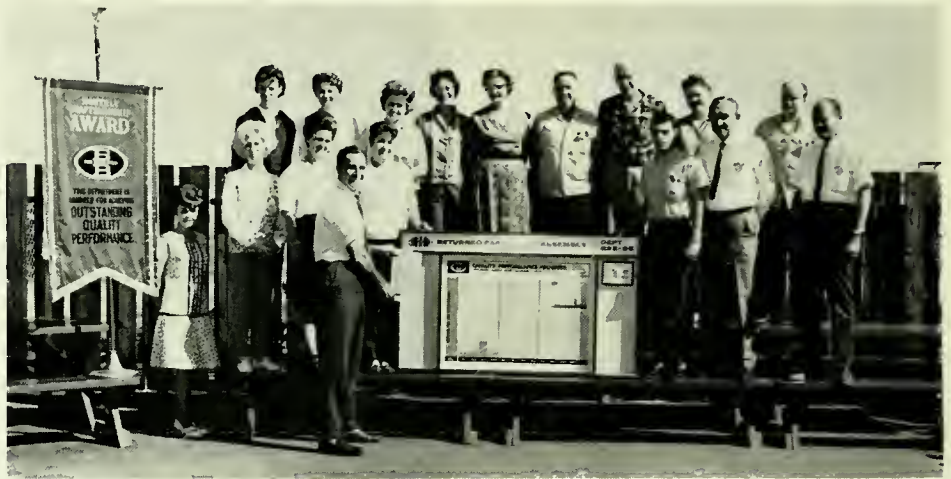
The big payoff in the "Builds Better" program is the condition in which the Ryan product is received by the customer, and the reliability of its performance in the field.

Indicative of the care with which Ryanites are performing their tasks in critical projects was a recent report received by J. R. Reichardt, Manager, Special Projects, following delivery of completed units in an important phase of the Model 147 project.

Of six units, four contained no defects whatsoever, and the other two had minor correctable defects.

"This is a reflection of the excellent effort being exerted by Ryan personnel in support of the 147 program," Reichardt declared. "This demonstration of a determination to build the best on behalf of this program is deeply appreciated."

Honored First Time In 'Builds Better' Competition



FIRST TIME "BUILDS BETTER" MONTHLY WINNERS AT KEARNY MESA PLANT, employees of Department 822-05, Returned Parts-Mod Assembly, proudly display Quality Performance Progress chart. Group was lauded in award ceremony by Paul L. Vissat, Superintendent, Manufacturing, shown pointing to chart.

Individual Winners



WINNERS of specially designed "Builds Better" ash trays in drawing among employees of Department 822-05 were Roy Louth, Fran Munson, and Zelda Stewart (Foreman Harry Wisner holds her prize).

QUARTERLY AWARD TO MACHINE SHOP

(Continued from Page 1)

told the employees as he paid tribute to their performance approaching "Zero Defects".

Each member of the department received a "Builds Better" calendar and note pad as personal recognition for a job well done, in addition to a "BB" match

Honored For Third Time



FOR THE THIRD TIME, Department 896-01, Space Assembly Shop (Surveyor) has won a monthly "Builds Better" award. D. A. George, foreman, at left, displays trophy for first shift employees J. Tinsley, Mary Ellen Curtis, Gen Kessler, Betty Zolezzi, and Jim Burton. Not shown in photo are Kay Turner and Luanne Carnes, second shift; and Virginia Ocello, Helen Herron and Nellie Hansen, since transferred to the Kearny Mesa plant.

container a "BB" pocket protector, and an "I Am A Winner" pin.

Refreshments were served during the presentations—at 9:30 a.m. for the 85 on the first shift, at 4:30 p.m. for the 64 on the second shift and at 7:15 a.m. for the 33 on the third shift.

STANDARDS LABS KEEP WATCH ON TEST EQUIPMENT

Test equipment is itself tested from the time it is ready to go into use at Ryan and throughout its application to Ryan products.

Operating as a quality control function, the company's standards laboratories keep a close watch on such equipment at all three plants. Much of this equipment is used in checking mechanical and electronic capability of completed Firebee jet

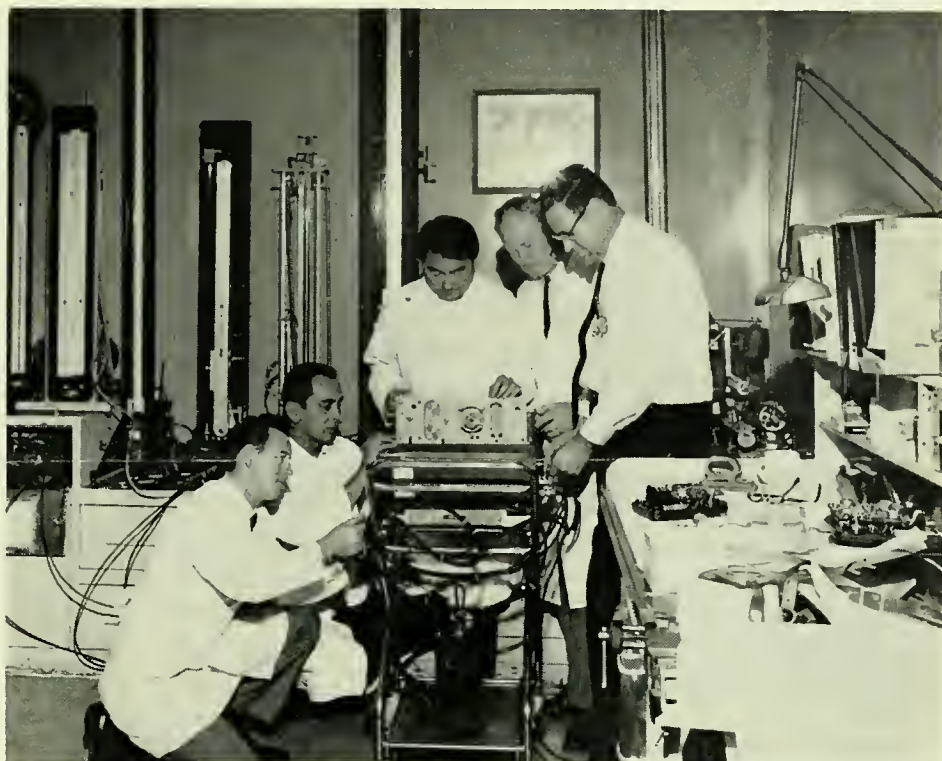
target drones in simulated performances when they come off the assembly line.

This is an essential link in the quality workmanship chain designed to achieve zero defects and top reliability of Ryan products in military use.

In addition to determining that test equipment meets complete specifications before it is applied to Ryan products, the standards laboratory also repairs such equipment when periodic checkouts determine the need for adjustments.

Standards laboratory employees also are dispatched to various bases where Ryan field crews support Firebee operations, and remain for extended periods to make sure that test equipment is functioning perfectly.

Technicians Check Equipment In Standards Laboratory



STANDARDS LABORATORY TECHNICIANS check a Fisher-Porter air speed and altitude simulator used in Firebee drone support checkout. In background are manometers and barometers, part of the apparatus utilized in the standards laboratory. Left to right, William T. Newkirk, Tom Enerva, E. T. Matsuda and Dan Barlow, all technicians, and George Wiegmann, laboratory supervisor.

Honor Roll Of Employees In Department 130

(Continued from Page 3)

S. Smith, T. G. Wrightson, A. L. Greenfield, A. B. Nunes, E. W. Hereth, E. B. Lanning, B. G. Allen, F. Lange, D. L. DeFreese, H. J. Smal.

THIRD SHIFT

SUPERVISION—R. R. Aston, Foreman; R. R. Saczko, Assistant Foreman.

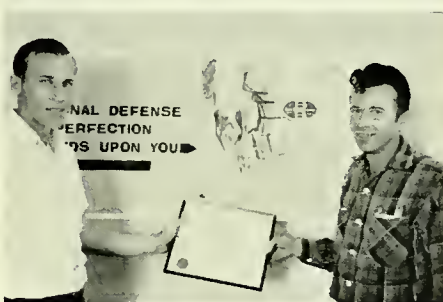
* * *

N. Sherrillo, T. Staley, R. Giamanco, F. A. Maestas, J. Thomas, R. W. Long, H. A. Crawford, C. E. Pulver, W. T. Ridley, O. Olsen, S. Vance, E. Robbins, R. K. Harper, R. T. Redo, P. E. Tanida, B. Patino, C. L. Amrine, J. Guzzardo.

R. E. Brown, R. H. Smith, D. C. Kosek, P. B. Miles, P. A. Nichols, J. L. Bellvill, N. B. Burke, R. R. Barnum, D. L. Hottel, W. J. Krueger, M. C. Koehn, M. J. Ralph, G. L. Weber, G. Raskind.

INSPECTION SUPERVISION—J. Chess,

Field Crew Man Honored



HONORED FOR TOP QUALITY workmanship during January with the Ryan field crew at the McGregor Range, N.M. was Lloyd C. Morrison, master mechanic, shown at left, receiving individual certificate of merit from J. F. Hooten, Assistant Base Manager.

A. Kwasigroch.

INSPECTORS—Sid Bodenhimer, A. De Silva, John La Pointe, Earl Mattson, William Mattson, John McGovern, Chuck Meade, William Oxley, M. Rewicz, C. Stevens, Ira Whitney, Ted Sabin, William Slaff.

FACTORY SUPPLIES — A. Ashton, K.

Perfect Record Cited



PERFECT "ZERO DEFECTS" RECORD for two consecutive weeks is pointed to on Quality Performance Progress chart of Department 154 by Jerry Ryan, coordinator of program.

(See Story, Page 1)

Creighton, G. Parsons, M. Gallison, J. Luman.

GENERAL SUPERVISION — Jim Pisciotta, Superintendent; O. W. Kupilik, Manager, Fabrication; Howard Engler, Director, Manufacturing.

Wins 'BB' Award



"BUILDS BETTER" Certificate of Merit for best "Zero Defects" record among members of Ryan field service crew at Pt. Mugu during January was won by Robert L. Todd, field support engineer, shown receiving award from R. R. Schwanhausser, Vice President-Aerospace Systems, at banquet in Oxnard.

Importance of 'Zero Defects' Emphasized

Personnel at one of Ryan's "outposts" were honored last month in a special "Builds Better" rally.

The 35-man Ryan crew supporting flight test operations at Pt. Mugu, Cal. were guests at a dinner in the Colonial House, Oxnard, where the importance of their efforts to attain "Zero Defects" was emphasized by officials from the San Diego plant.

R. R. Schwanhausser, Vice President-Aerospace Systems, and Jerry Ryan, "Builds Better" program coordinator, pointed out the vital need for high quality workmanship, and commended the Ryanites for their performance at Pt. Mugu, site of the company's largest flight test operational support.

Robert L. Todd, field support engineer, was awarded the Certificate of Merit for the best "Zero Defects" record in the crew during the month of January.

Teamwork Leads To Perfect Performance

Teamwork in two of Ryan's most frequently honored departments in the "Builds Better" competition resulted recently in perfect "Zero Defects" performances for full week periods.

This achievement was credited to Department 822-02, Electrical Harness As-

Ryan Crew At Pt. Mugu Honored At "Builds Better" Rally



RYAN FIELD SERVICE CREW AT PT. MUGU was honored last month at a dinner at which R. R. Schwanhausser, Vice President-Aerospace Systems, shown addressing the group, stressed importance of the company's "Zero Defects" program.

sembly, and Department 822-03, Magnetics Assembly, both in the Kearny Mesa plant.

Assemblies produced in Department 822-02, which has won monthly "Builds Better" awards more times—six—than any other department in all three Ryan plants, underwent 1,420 inspections during an entire week without a single defect.

Functional tests of work performed in Department 822-03 showed two recent consecutive weeks of errorless assembly. It was revealed that since last May, this group has achieved 100 percent "Zero Defects" during four separate weeks.

"These performances are the result of a genuine desire of the personnel to do

good quality work, and the ability of production supervision to develop new methods and instill an incentive to achieve perfection," Ray Cleveland, General Foreman, said

The record of Department 822-03 was considered particularly outstanding because of the wide variation of testing required on the transformers and filters built in Magnetics Assembly.

"In cooperation with quality control personnel, the employees in both these departments are constantly seeking improved methods to make the reliability of Ryan products as close to perfect as is humanly possible," Cleveland commented.

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE

PAID

SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

APRIL BULLETIN

VOL. 2, NO. 5

RYAN AERONAUTICAL COMPANY

APRIL 20, 1967

DEFECTS DROP IN SUPERSONIC FIREBEE WORK

A remarkable reduction in errors has been effected in the Model 166 Supersonic Firebee II production program since inspection "tracking" began last November on the new generation of the famed Ryan jet target drones.

As employees became increasingly familiar with their tasks, the number of defects per 100 inspections, requiring rework, has dropped steadily, to a low in

recent weeks of less than 3 percent in Department 254, final assembly.

Accompanying this achievement was a spectacular performance during the first two weeks of April in all other manufacturing areas "feeding into" Department 254—including sub assembly, processing, engineering, planning and tooling. In that fortnight, not a single defect was chargeable to these activities, an outstanding performance on a new configuration.

The first Model 166, the static test unit, has been completed and is in the static testing phase. Two other configurations, for flotation and captive flight

(Continued on Page 2)

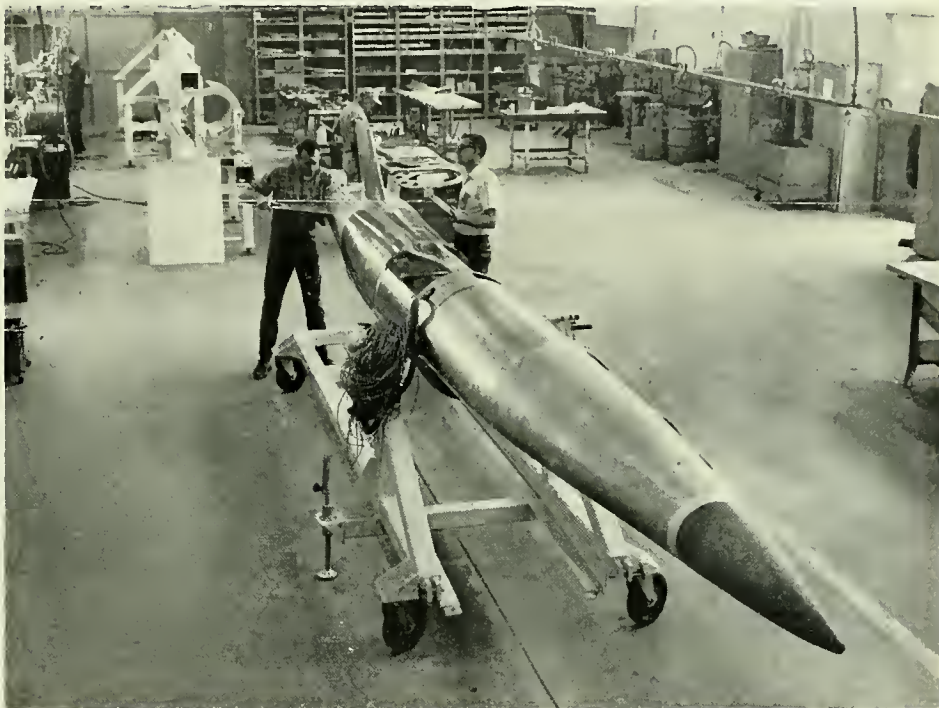
DEPT. 130 WINS NEW RECOGNITION

Importance of even the most minute operation in production of Ryan products was emphasized recently as Department 130, Machine Shop, the largest department in the main plant, was presented its first

monthly award in the "Builds Better" program.

Department 130 reversed the usual procedure by first winning a quarterly award, recognizing its consistent down trend of defects during the last three months of 1966, before gaining a monthly award. The most recent recognition was for the month of February.

First Model 166 Completed For Static Testing



SUPERSONIC FIREBEE II static test vehicle, first of 15 of this new generation of Ryan jet target drones to be built in initial Navy contract, has been completed and is in static testing. (MORE PHOTOS, PAGE 2.)

Machine Shop Gains Its First Monthly Award



FIRST MONTHLY AWARD earned by Department 130, Machine Shop, in "Builds Better" competition, followed receipt of quarterly award for last three months of 1966. First shift is shown above in recognition ceremonies. Howard Engler, Director of Manufacturing, presents plaque to Jerry De Witt. (MORE PHOTOS, PAGE 3.)

In a speech to first shift employees, Howard Engler, Director of Manufacturing, called attention to a recent incident in which omission of a small lock washer under a grounding screw resulted in an

incomplete circuit that caused a Ryan Firebee to go into uncommanded recovery in mid-mission. All recovery equipment functioned perfectly, and the drone was

(Continued on Page 2)

DEFECTS DROP IN SUPERSONIC FIREBEE WORK

(Continued from Page 1)

tests, will be applied to this unit on completion of the static test program.

In addition, engineering requirements for functional testing have been completed on the first flight test model, which will be sent this summer to the Navy's Pacific Missile Range at Pt. Mugu, Cal. for further ground tests and actual flights.

Ryan is building 15 Firebee II's under an initial contract awarded by the Navy.

The static test unit has been instrumented with sensors at each key stress point to accommodate a battery of checks

to verify design specifications. Included in the ground test program are 12 major phases related to antenna environmental evaluation, a major share of which has already been completed with use of a full-scale mock-up atop a 40-foot mast at the Electronic and Space Systems facility on a bore sighting range.

Designated by the Navy as XBQM-34E, the Firebee II is designed for both sub and supersonic speeds, incorporating an external fuel pod for subsonic missions. This pod will be jettisoned on completion of subsonic flight, and internally stored fuel will be used for supersonic dash missions.

DEPT. 130 WINS NEW RECOGNITION

(Continued from Page 1)

recovered without damage.

"This demonstrates how important every person's job is, and emphasizes the need for achieving zero defects in the "Builds Better" program for which you are being honored with this monthly award," Engler said.

Special award ceremonies were also conducted for the second and third shifts of the department, which has approximately 175 employees.

Winners of the drawing for "Builds Better" ash trays were Martin Simonides, M. J. Rewicz, E. A. Small, J. McGovern, C. Stevens, G. S. McCot, Bill Driscoll, L. Anker, W. L. Hammond, Herman McGraw, H. J. Freeman, B. G. Allen, C. W. Harris, L. F. Polando, F. A. Lublow, A. L. Greenfield, N. M. Plastina, B. Steuermann, Ray Harper, P. B. Miles, Roy D. Lack, and Frank Maestas.

Pride In Workmanship On Model 166 Exemplified



SYMBOLIC OF THE PRIDE TAKEN IN WORKMANSHIP on Ryan's new Model 166 supersonic Firebee II are efforts of Jim Madill, above, and Russ Hanson, below, aircraft assemblers, Department 254, final assembly. They represent the department in new "Builds Better" poster now being displayed throughout all Ryan plants, along with sketch of Betty C. Zolezzi, of Department 896, Lunar Module Final Assembly, Electronic and Space Systems. Message on poster reads: "They all agree: Pride in work is the key to ZD."



LM RADAR UNIT HONORED FOR 'ZD' RECORD

A vital contribution to the nation's space program has been virtually completed by one group of Ryanites in the Electronic and Space Systems facility.

This is the Lunar Module Cordwood Assembly portion in Department 896, which ended its major activity with an outstanding "Zero Defects" record.

This group won two monthly awards in 1966, for August and November, and climaxed its performance by being designated winner of the quarterly award for the best record at the Electronic and Space Systems plant for the last three months of the year.

With most of the employees reassigned to other departments, the traditional award ceremony could not be conducted. Each worker is receiving a personal memento of his achievement—a handsome "Builds Better" calendar and note pad. This is accompanied by a message from W. J. Wiley, Vice President-Plant Operations, expressing appreciation for the "high quality of work you and your teammates achieved on Ryan's space electronics programs."

The cordwood assembly shop built small modules for motherboard assemblies in the Lunar Module landing radar program. Earlier, the same tasks were performed on the highly successful Surveyor navigational radar program. Motherboard assembly and final assembly activity is continuing at the Electronic and Space Systems facility.

FIELD CREW MEN PERFORMANCE CITED

Individual certificates of merit for outstanding quality workmanship during recent months have been awarded to members of Ryan field crews at McGregor Range, N.M. and White Sands Missile Range, N.M.

Honored at McGregor Range were:

G. B. Oliver, target systems mechanic; L. C. Morrison, engineering master mechanic, flight test; and B. P. O'Hara, target systems assistant mechanic.

Given special recognition at White Sands

Machine Shop Second And Third Shifts Honored



SECOND AND THIRD SHIFTS of Department 130, Machine Shop, above and below, are pictured in recent award ceremonies honoring groups for their contribution to excellent "Builds Better" record, best in main plant for February. Representing second shift employees, Sarah Proud receives plaque from Howard Engler, Director of Manufacturing, and Nick Sherrillo is handed plaque by Engler on behalf of third shift workers.

SEE PHOTO AND STORY, PAGE 1



Lunar Module Final Assembly Department Cited



TOP "BUILDS BETTER" PERFORMANCE in March won monthly award at the Electronic and Space Systems plant for Department 896-02, Lunar Module Final Assembly. Plaque presentation was made by Robert H. Guyer, Manufacturing Manager, who lauded teamwork between engineering and manufacturing activities.

Missile Range were:

Billie Bradshaw Van Deren, inventory auditor analyst; and J. D. Blankenship and B. D. Turnbull, both target systems me-

chanics.

Individual awards are given monthly to field crew men whose workmanship attains the best "Zero Defects" level.

DEPT. 822-02 WINS 2 AWARDS AT SAME TIME

The most honored department in the Ryan "Builds Better" competition, 822-02, Electrical Harness Assembly, has been cited simultaneously for its seventh monthly award and its second quarterly award, for the last three months of 1966.

A highlight of its February record, for which the monthly award was earned, was a perfect "Zero Defects" accomplishment during an entire week. Assemblies produced in Department 822-02 underwent 1,420 inspections without a single defect.

Tribute to the department was paid at the award ceremonies by Jerry Ryan, "Builds Better" program administrator, and Robert H. Guyer, Manufacturing Manager, who said, "You are setting a tremendous example for everyone in the company."

In addition to its seven monthly and two quarterly awards, Department 822-02 has received the first and only special award granted to date—for an outstanding sustained low defects record in mid-1966.

The special award gave the department possession of the original "Zero Defects" pennant presented employees of the Kearny Mesa plant when the "Builds Better" program was launched in 1965.

In the traditional drawing among employees of the winning department, specially designed "Builds Better" ash trays were won by John De Water, Kathryn Askew, Helen J. Kerson, Reba Street, Mary Jo Longbottom, Violet Villieres, Tom Usler, and Patricia Rolf.

'Most Honored Department' Does It Again



MOST HONORED DEPARTMENT IN RYAN "BUILDS BETTER" COMPETITION, 822-02, Electrical Harness Assembly, Kearny Mesa plant, has won double recognition, its seventh monthly prize and second quarterly award. Employees proudly display Quality Performance Progress chart, which shows consistent operation at levels only a "hairline" above Zero Defects. One of most recently weekly plots showed no errors. Each employee received 'Builds Better' calendar note pads.

Engineering Support Group Wins Monthly 'BB' Award



MONTHLY AWARD for February in "Builds Better" sweepstakes at the Electronic and Space Systems plant was won by Department 896-03, Engineering Support. Robert H. Guyer, Manufacturing Manager, presented plaque to employees.



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY
P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

MAY BULLETIN

VOL. 2, NO. 6

RYAN AERONAUTICAL COMPANY

MAY 22, 1967

'BUILDS BETTER' PROGRAM NOTES ANNIVERSARY

Quality workmanship has become the major objective at all Ryan plants in the "Builds Better" program, which celebrates its second anniversary this month.

It was on May 24, 1965, that the program, aimed at reducing defects, increasing reliability of the finished products, and instilling pride in individual efforts, was launched at the Space and Electronic Systems plant following an "open house" attended by nearly 2,000 employees, their families, friends and special guests.

The "Builds Better" plan was extended to the Kearny Mesa plant the following September, and soon afterward encompassed the main plant, as well as field service crews providing support for Firebee operations at military bases.

One of the principal benefits derived from the program in its two years' existence is the heightened spirit of employees as they strive for the "Zero Defects" level in competition among departments leading to monthly and quarterly awards. Individual certificates of merit have also recognized personal achievement.

The tribute paid by Jerry Ryan, administrator of the "Builds Better" program, on the first anniversary, is still fitting today: "Pride of craftsmanship is one of the great motivating forces in this entire program, and the collective results are not only improving Ryan products while meeting delivery schedules, but are materially assisting the nation's defense effort."

Following are winning departments in the plantwide "Builds Better" competition (1 award except as otherwise noted):

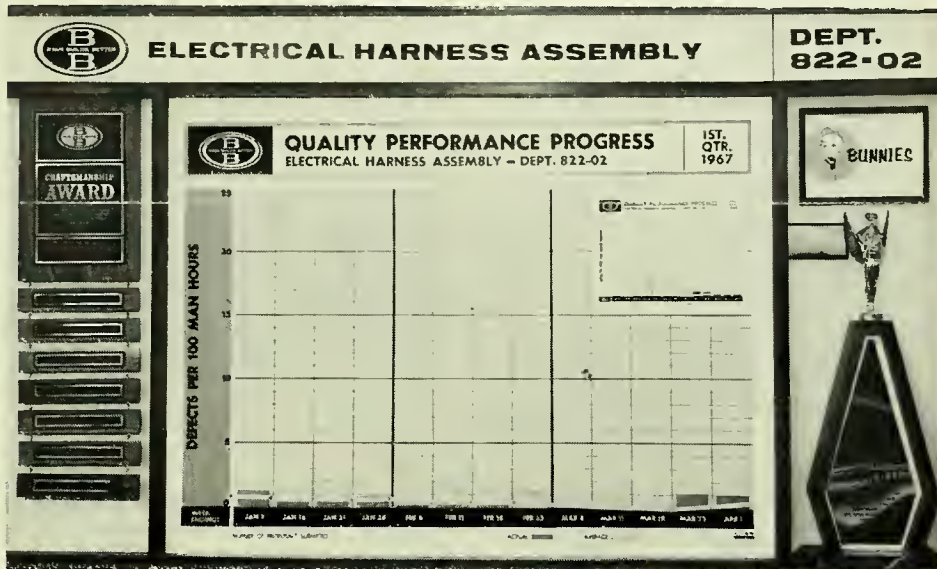
MAIN PLANT

QUARTERLY AWARDS—Machine Shop, Dept. 130; Processing and Paint, Dept. 140.

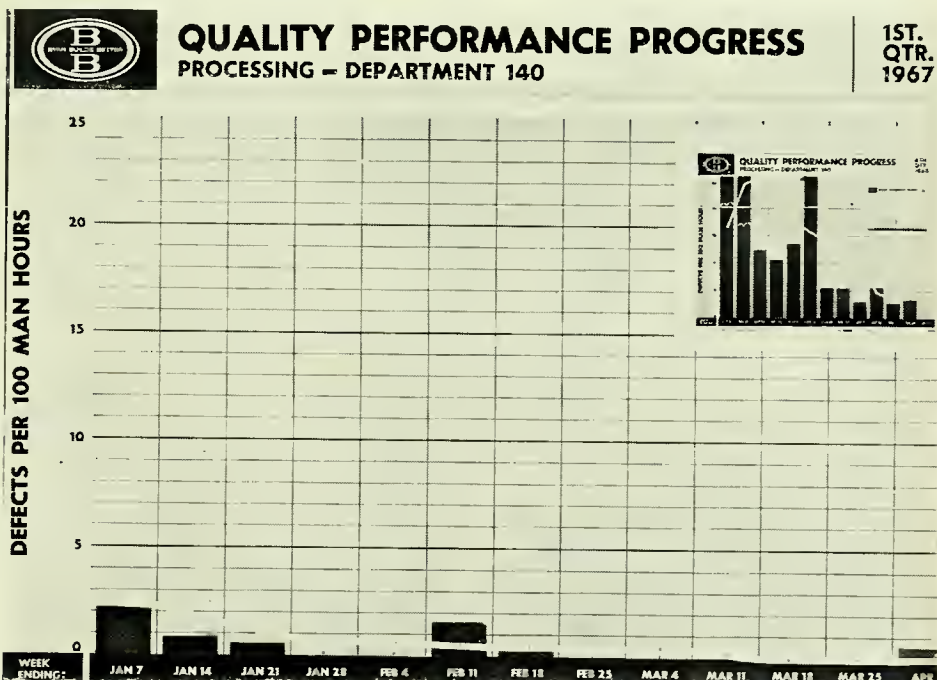
MONTHLY AWARDS — Machine Shop, Dept. 130; Processing and Paint, Dept. 140; Metal Products, Dept. 151 (2 awards); Models 124A, 147, 166 Subassembly,

(Continued on Page 2)

'Zero Defects' Celebrated On 2nd Birthday Of 'BB'



MOST HONORED DEPARTMENT in two years of Ryan "Builds Better" program is Electrical Harness Assembly, Dept. 822-02, Kearny Mesa plant, which has won seven monthly and two quarterly awards, as indicated by plaque and trophy alongside Quality Performance Progress chart showing extremely low level of defects in recent period.



VAST IMPROVEMENT in quality workmanship, under impetus of "Builds Better" program, which celebrates its 2nd anniversary this month, is typified by Processing and Paint, Dept. 140. Note sharp drop in defects in chart for first quarter of 1967 under last quarter of 1966. Quarterly award for best such performance in the main plant went to this department.

EFFORT AIMED AT FIVE-FOLD IMPROVEMENT

"5X" is the symbol of a lofty goal set for the Model 154 program.

When Howard Cortner, senior reliability engineer, was convinced that an attempt should be made to achieve a five-fold improvement in reliability over even the previous high standards in drone projects, the "5X" symbol was conceived.

Posters containing only this symbol, with no explanation, were displayed for about a week in engineering departments

of the Model 154, and in fabrication shops, to pique the curiosity of employees.

These were followed with fully explanatory posters carrying the message, "Model 154 goal five times greater reliability." The posters were designed by Jack Salley, Graphic Arts "Builds Better" art coordinator.

This unusual stimulus to employee achievement was fully endorsed by Adolph Bolger, Superintendent of Model 154 Assembly, and Jerry Ryan, "Builds Better" program administrator.

2ND ANNIVERSARY OF 'BB' PROGRAM

(Continued from Page 1)

Dept. 154; Drone Assembly, Dept. 252.

QUARTERLY AWARDS — Model Shop, Dept. 895; Space Assembly Shop (LM Cordwood), Dept. 896-01 (2 awards); LM Final Assembly, Dept. 896-02.

MONTHLY AWARDS — Model Shop, Dept. 895; Space Assembly Shop (Surveyor), Dept. 896-01 (3 awards); Space Assembly Shop (LM Cordwood), Dept. 896-01 (2 awards); LM Final Assembly, Dept. 896-02 (2 awards); Engineering Support, Dept. 896-03 (4 awards).

KEARNY MESA

QUARTERLY AWARDS—Electrical Harness Assembly, Dept. 822-02 (2 awards); Magnetic Assembly, Dept. 822-03; Model 147 Black Box Fabrication, Dept. 822-04 (2 awards).

MONTHLY AWARDS — Electronics Assembly, Dept. 822-01 (2 awards); Electrical Harness Assembly, Dept. 822-02 (7 awards); Magnetic Assembly, Dept. 822-03 (3 awards); Model 147 Black Box Fabrication, Dept. 822-04.

'5X' Symbol Spurs Employees To Improved Reliability



POSTERS AIMING AT FIVE-FOLD IMPROVEMENT over even the previous high reliability standards of other Ryan projects are examined by Howard Cortner, senior reliability engineer, who suggested this type of appeal as a feature of the "Builds Better" program.

Two Departments Honored With 'Builds Better' Awards



TWO "BUILDS BETTER" AWARDS WERE WON SIMULTANEOUSLY by Magnetic Assembly, Dept. 822-03, Kearny Mesa plant, including the first quarterly honors received by this department and its third monthly recognition. The dual achievements were for the first quarter of 1967 and the month of March. Foreman Earl Hall, second from left, holds quarterly award trophy, while Tawana Todd holds monthly award plaque as Robert H. Guyer, Manufacturing Manager, affixes third rung.



FIRST "BUILDS BETTER" AWARD is won by Department 252 Drone Final Assembly, main plant, as result of its outstanding record of reducing defects during the month of March. Representing employees in presentation of plaque by H. E. "Pappy" Dukes, Manager of Assembly, is Elsie L. Skipworth. Chart shows steady improvement in department's striving toward "Zero Defects" goal.

NEW MACHINES TO HELP ATTAIN 'ZERO DEFECTS'

Machines as well as men and women make possible the constantly improving Ryan "Zero Defects" performance.

To meet expanding production requirements, a machine tool modernization pro-

gram is nearing completion. Four large numerically tape-controlled drilling and milling machines have been installed, and the fifth, and last, machine in the current modernization of facilities is due to go into operation in about 60 days.

Typical of the giant equipment designed to combine extreme accuracy with a stepped-up production pace is the newest machine to go into operation, a giant H & H Wilson four-spindle, three axis milling machine. This machine and others in the modernization program will bolster Ryan's "Builds Better" objectives by not only increasing accuracy, but also simplifying tooling, reducing per part inspection time, enhancing ability to produce parts and tooling to engineering requirements, and virtually eliminating operator type errors.

ERROR-FREE WORK ON CIRCUIT BOARDS

A remarkable record of error-free work on drafting and fabricating of highly complex multi-layer and double-sided solid state integrated circuit boards for new Doppler radar systems has been achieved at the Electronic and Space Systems plant.

This is a prototype project so complex that chances of defects would normally be quite high. "We can't tolerate any mistakes in this work," George Felix, foreman

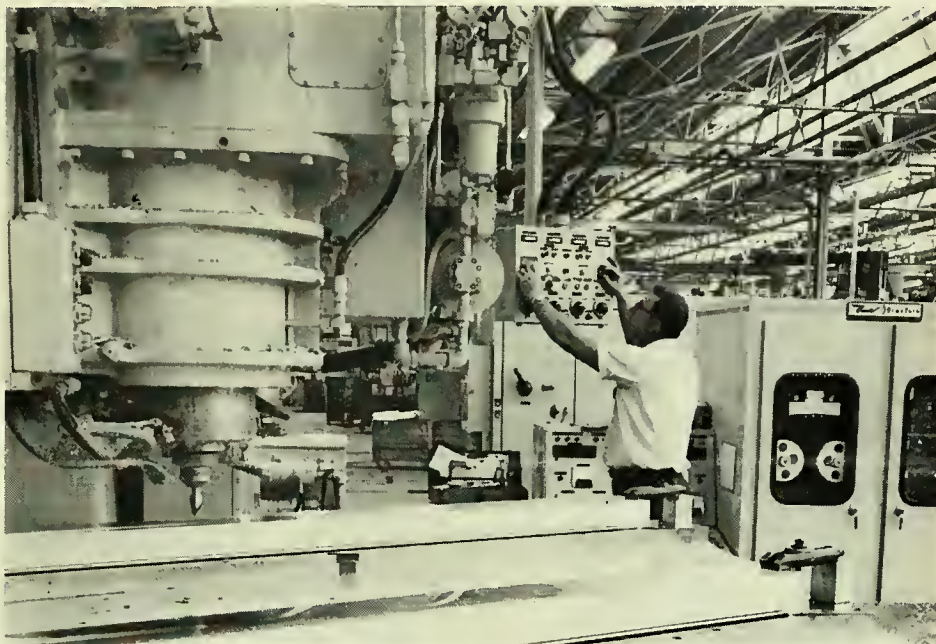
of Department 896, Engineering Support, explained. "Every mistake would be compounded by the complexity of the boards and would cause a serious delay in meeting delivery schedules."

The tremendous attention to detail required in the production of these prototype components for electronic systems of aerospace vehicles is exemplified by the fact that one unit will have as many as 3,000 soldered joints.

Felix paid special tribute to the team

(Continued on Page 4)

Tape-Controlled Milling Machine Installed



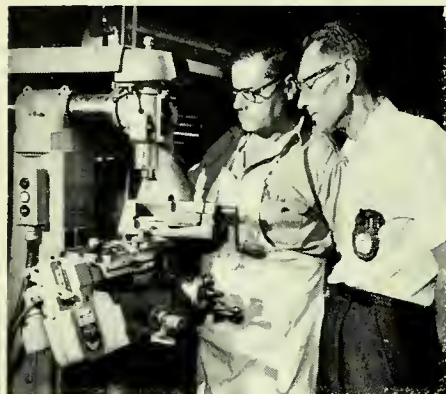
GIANT MILLING MACHINE operated by Walter L. Hammond, H & H Wilson tape-controlled profiler, is the newest to go into operation in main plant in current modernization program.

Remarkable Record Achieved In Prototype Project



OUTSTANDING ERROR-FREE RECORD in drafting and fabrication of prototype circuit boards for new Doppler radar systems is being achieved at Electronic and Space Systems plant. The complex unit and engineering drawing are examined by, left to right, Jack Lowry, Don Dearduff and Ken Shocklee of Engineering Design.

Superior Workmanship Of Individuals Cited In Department 895



SINGLED OUT FOR SPECIAL RECOGNITION in award-winning Department 895, Model Shop, at Electronic and Space Systems plant, were the employees pictured above. In photo at left, Harry R. Bell, research machinist technician, with his foreman, L. J. Fann. In center, Nora Cook, printed circuit board fabricator, with her foreman, Bob Ross. In photo at right, John Atanasoff, electronic mechanic master engineering research.

PRODUCTION PROBLEM SOLVED AT K.M. PLANT

An example of individual application to solution of a production problem, with resultant increased reliability and time savings, has been afforded by Leopold G. Imbimo, Jr., assistant foreman, Department 822-04, Kearny Mesa plant.

In the past, needle-nose pliers were used in bending resistor and diode leads for electronic assemblies. This caused occasional nicks and scratches that could ultimately lead to stress concentration points after long periods of vibration.

Imbimbo designed a small special wiring jig that enables the assemblers to merely use their fingers in wrapping the wires around the tiny "posts" to make the two required bends. This virtually eliminates the possibility of damage in the bending process, and has not only produced a virtual "zero defects" record, but has slashed the time required for this stage of assembly. The jig will be built in six sizes for varying dimensions of resistors and diodes.

Imbimbo's solution is considered typical of the means by which individual ingenuity can implement the plantwide "Builds Better" program.



INCREASED RELIABILITY and reduced assembly time have been effected by Leopold C. Imbimbo, Jr., assistant foreman, Department 822-04, Kearny Mesa plant, by design of a small special wiring

Behind every monthly or quarterly "Builds Better" award is the superior workmanship of individual employees.

This was evidenced in the recent recognition of Department 895, Model Shop, which won the quarterly honors for the first three months of 1967 as a follow-up on its monthly award of last December.

Personal interest in their tasks and a desire to achieve perfection on difficult jobs were attributed to several members of the department by W. C. Truchan, General Foreman.

Among those singled out for a special spotlight were Harry R. Bell, research machinist technician; John Atanasoff, electronic mechanic master engineering research; Barbara Mays, and Nora Cook, printed circuit board fabricators; and G. E. Archambault, photo and reproduction technician.

jig, for an electronic assembly. Imbimbo is shown holding jig above electronic component.

Error-Free Work Lauded

(Continued from Page 3)

effort provided by electronic assemblers Evelyn Medearis, Helen Lopez, Rae Jamieson, Joyce Menges, Joyce Eade, Dorothy Wilson, Ann Hise, and Leonard Tucker.

Also singled out for special recognition in the "Zero Defects" phase of the program were Sylvia Haight, inspector; and the drafting team directed by Don Dearth, assistant group engineer. R. L. Ogram is Program Manager.

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

JUNE BULLETIN

VOL. 2, NO. 7

RYAN AERONAUTICAL COMPANY

JUNE 20, 1967

QUARTERLY AND MONTHLY 'BB' AWARDS MADE

Three monthly and two quarterly "Builds Better" awards were announced this month.

One department was honored simultaneously with both types of honors. For greatest progress in reducing defects at the Electronic and Space Systems plant, Department 895, Model Shop, received its first quarterly award, covering the first three months of 1967. At the same time, it was recognized for the best record during April, thus receiving its second "Builds Better" monthly award since inception of the "Zero Defects" program.

Ryan's most honored group of employees in this respect, Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, was presented a monthly award for the eighth time. This department has, in addition, received two quarterly awards.

A first time quarterly award winner is Department 140, Processing and Paint, main plant, which earlier had won its first monthly honors. Department 140 achieved a 100 per cent zero defects level during a substantial portion of the first quarter of 1967.

Department 154 was cited for its second monthly award as result of its April, 1967 sub assembly performance in the main plant.

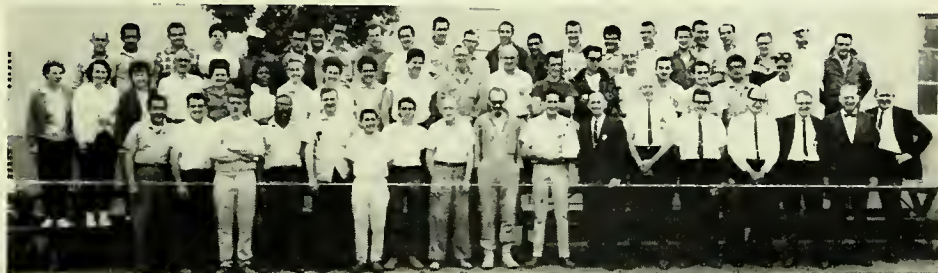
FLAG FEATURED IN 'BB' DISPLAYS

The national colors are being prominently displayed in full color posters throughout all three Ryan plants during the period from Flag Day, June 14, to Independence Day, July 4.

The flag is featured in 200 posters that also contain the message, "Keep Your Nation Strong, Give It Your Best" — a re-

(Continued on Page 2)

Departments Honored For Sharp Reduction In Defects



QUARTERLY AWARD IS WON FOR FIRST TIME by Department 140, Processing and Paint, main plant, which achieved a spectacular drop in level of defects from the fourth quarter of 1966 through the first quarter of 1967, for which award was made. Each employee received a "Builds Better" calendar and note pad as personal recognition. Clyde H. Mullins, painter general, holds trophy presented by Howard Engler, Director, Manufacturing, standing alongside Mullins.



BEST PERCENTAGE REDUCTION IN ERRORS of any department in main plant for month of April was achieved by Department 154, Models 124A, 147, and 166 Sub Assembly. "Builds Better" award was made by H. E. Dukes, Manager of Assembly, shown making presentation to Jess Miramontes, holding monthly award plaque, and Ed Hall, affixing second rung.



EIGHTH MONTHLY AWARD in "Builds Better" program has been earned by Department 822-02, Electrical Harness Assembly, Kearny Mesa plant. With two quarterly awards also to its credit, this department continues to rank as the "winningest" in all three plants. Surrounding Quality Performance Progress chart that depicts low level of defects are department employees, who were lauded by Paul L. Vissat, Superintendent, Manufacturing, shown adding another rung to award plaque.

CONSISTENCY OF DEPT. 253 WINS RECOGNITION

A group of Ryan employees has been so consistent in maintaining a low level of defects that it has literally deprived itself of formal recognition in the "Builds Better" program.

So uniformly scarce have been the production errors in Department 253 during the past year that it has been unable to qualify for either monthly or quarterly "Builds Better" awards, which are granted on the basis of improved performance.

The department, which produces all major sub assemblies on a Ryan jet target

drone project in the main plant, rarely has gone above 2 defects per 100 manhours, dating back to July, 1966.

During the third quarter of 1966, for example, this department exceeded that defects level only four weeks out of 13, and in each of those weeks, the defects were less than 3 per 100 manhours.

During the fourth quarter of 1966, there were only three weeks out of 13 in which defects exceeded 2 per 100 manhours. For eight weeks, the defects level was either less than or barely more than 1 per 100 manhours.

During every one of the 13 weeks in the first quarter of 1967, the defects level was below 2, and was at 1 or less during 10 of these weeks.

And the latest available figures for the second quarter of 1967, show only one week out of 8 in which defects exceeded 2 per 100 manhours.

"This has been accomplished through a combination of excellent supervision and a conscientious attitude of the hourly workers, many of whom have been with Ryan a long time," Robert Dickinson, General Foreman, explained.

Department 253 recently moved from the drone production area in Building 140 to the old Boeing production area in Building 152, which has been remodeled and repainted. Its present payroll of 57 is slated for expansion during the next few months in a steady buildup of work load.

FLAG FEATURED IN 'BB' DISPLAYS

(Continued from Page 1)

minder that the U.S. government, Ryan's principal customer, expects top quality

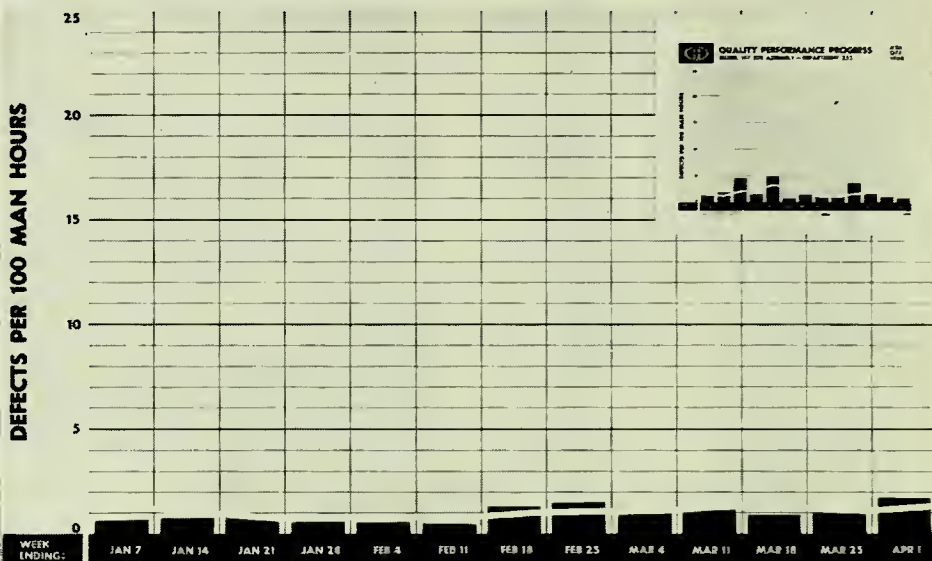
Record Of Low Defects Maintained For Long Period



QUALITY PERFORMANCE PROGRESS

MODEL 147 MAJOR SUB ASSEMBLY - DEPARTMENT. 253

1ST.
QTR.
1967



TYPICAL OF LOW DEFECTS record of Department 253, main plant, is the performance shown in this chart for first quarter of 1967. Number of defects were 100 manhours hovered around the 1 mark throughout period. The department's very consistency has disqualified it from "Builds Better" awards, which are made on basis of improvement. Record for fourth quarter of 1966, upper right hand corner, also shows consistently low rate of defects.

'Old Glory' Featured In New 'Builds Better' Posters



NEWEST "BUILDS BETTER" POSTER features the American flag and is being displayed throughout all three Ryan plants during the period from Flag Day, June 14, to Independence Day, July 4.

production.

Aimed at sharpening the sense of obligation to achieve perfection in producing

critical materials for the national defense, the patriotic display is a feature of the continuing Ryan "Builds Better" program.

IMPROVEMENT OF SKILLS SOUGHT BY 53 RYANITES

Symbolic of the extra effort made by employees dedicated to self-improvement in the "Zero Defects" program is recent completion of a 10-hour course in blueprint/schematic reading.

A total of 53 employees attended the course on a voluntary basis after working hours. The instruction consisted of five sessions, two hours each, from 4:15 to 6:15 p.m. Tuesdays and Thursdays.

They sharpened their knowledge of blueprint reading in circuit board, harness assembly and sub assembly tasks. Instructors

were Sid Felsen, Jay Filer and Dan O'Shea.

Certificates of completion were presented to the graduates June 7 by Felsen and Jerry Ryan, Administrator of the Ryan "Builds Better" program.

A new course, in basic electricity, has been proposed for once a week, 3 hours each session. Over-all length of the course and time of its start have not yet been determined.

Employees Complete Blueprint Reading Course



GRADUATES OF BLUEPRINT/SCHEMATIC READING COURSE, attended on a voluntary basis after working hours, display certificates of completion awarded in ceremonies this month. They are part of a class of 53 taught by Sid Felsen, Jay Filer and Dan O'Shea. Felsen is shown in photo with students.

Wins Merit Certificate



INDIVIDUAL MERIT CERTIFICATE is presented to G. B. Oliver, right, target systems mechanic in the Ryan field service crew at the McGregor Range, N.M. by B. C. Harlow, assistant base manager. Oliver was recognized for superior workmanship during month of March.

SUBSIDIARY AIMS AT 'ZERO DEFECTS'

The successful Ryan "Builds Better" program in the San Diego plants was recently outlined to officials of the Wisconsin Motor Corp., subsidiary of Ryan's majority-owned Continental Motors Corp.,

Department 895 Wins 'BB' Quarterly Award



BEST "ZERO DEFECTS" RECORD FOR FIRST QUARTER of 1967 in Ryan Electronic and Space Systems plant was attained by Department 895, Model Shop, which simultaneously also won the monthly award for April. This is the first quarterly honor and second monthly award won by this department. Robert H. Guyer, Manufacturing Manager, presented trophy to Barbara Jordan, printed circuit board fabricator, on behalf of employees.

in Milwaukee, Wis.

Jerry Ryan, "Builds Better" Administrator, conferred with Wisconsin Motor executives who are planning to establish a "Zero Defects" objective at their firm's two plants, which produce engines for both military and commercial applications.

With more than 2,000 employees, Wisconsin Motors is expanding its production capabilities. Recently, David C. McLees, who has held numerous key personnel relations positions at Ryan, joined Wisconsin Motors as Director of Industrial Relations.

WIDE RANGE OF GRAPHIC ITEMS IN 'BB' PROGRAM

The wide variety of material used to provide motivational support for the Ryan "Builds Better" program is created by the Graphic Arts Department in the main plant, headed by Jim McGowan, Manager, and Ron Evans, Senior Art Editor.

Two hundred eye-catching bulletins, containing constantly changing "Builds Better" messages aimed at impressing on employees the necessity for maintaining a high level of quality workmanship, are

distributed and posted within all three Ryan plants and in field unit areas every three weeks.

Jack Salley, Art Coordinator, designs, illustrates and produces this visual material, in addition to numerous other "Builds Better" graphic items, such as pamphlets, performance charts, award material, and various promotional items. He also arranges the award ceremonies and presentations.

When the finished art is completed for the posters, it is turned over to the Photo Reproduction and Silk Screen Department, of which Al Crooks is Manager and Chuck Moelter is Supervisor. Here silk screen printing is done by George Masing and Chuck Dusky.

Salley, who coordinates the art work, joined Ryan last December after graphic art duties in the supersonic transport program of the Boeing Company, Seattle. From 1961 to 1963 he served in the Training Aids Division of the Army Engineer School at Fort Belvoir, Va.

The visual displays include a series of

Silk Screen Process Utilized For Posters



"RYAN BUILDS BETTER" POSTERS are produced by the silk screen process in the main plant by Chuck Dusky, left foreground, and George Masing, silk screen reproduction specialists. At right is Jack Salley, Art Coordinator, who designs, illustrates and produces the posters and other graphic materials.

Newly Designed Cups, Coasters Due In Cafeteria

A handsome new "Builds Better" design will adorn the coffee cups and coasters used in the cafeteria and for refreshments

"people posters" featuring Ryan employees with noteworthy performance records. These posters are illustrated by Bob Watts and Ken Martin of the Graphic Arts Department.

during ceremonies at which departments are honored for reduction of defects.

The traditional "Builds Better" symbol will be surrounded by a black and gold spiral scroll created by Jack Salley, Art Coordinator of the "Zero Defects" program. The new cups and coasters, available in July, will replace the present ones, which feature a solid brown design.



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

JULY BULLETIN

VOL. 2, NO. 8

RYAN AERONAUTICAL COMPANY

JULY 20, 1967

CRITICAL PRODUCTION UNDER WAY



AMERICAN ASTRONAUTS' LIVES will depend on perfect performance of Ryan Landing Radar system, now in actual manned spaceflight hardware production at Electronic and Space Systems plant. This sequential series of sketches shows Lunar Module being decelerated to soft landing on the moon as rockets are "triggered" by Ryan Lunar Landing Radar System. "Zero Defects" in workmanship is more imperative than ever as time approaches for Project Apollo's first manned lunar landing.

The lives of the first American astronauts to land on the moon will depend on the perfection attained by Ryan employees in one of the most critical production programs of the company's long history.

Fabrication has begun at the Electronic and Space Systems plant on the Lunar Module Landing Radar systems which will be responsible for the soft landings of the capsules carrying the Project Apollo astronauts.

Assembly of electronic cordwood com-

ponents for the first "manned spaceflight hardware" system, designated Production Model P-27, is underway in the space assembly "clean room."

"We are scheduled to build and deliver 13 radar units by mid-1968," Ned L. Olthoff, Lunar Module Program Manager, said. "From among this group, radar systems will be selected for installation on the Apollo Lunar Module flight vehicles which will actually make the moon landings."

In recognition of the importance of absolute "Zero Defects" assembly and test of these man-rated radar systems, a special "Ryan Builds Better" campaign has been launched. Special posters, labels, tags and other materials are being prepared under direction of Jerry D. Ryan, "Builds Better" Administrator.

"The quality of individual workmanship on the LM program has been high," Ryan said. "Many significant improvements

(Continued on Page 2)

ASTRONAUTS' LIVES DEPEND ON RYAN RADAR

(Continued from Page 1)

have been made in assembly techniques, often at the suggestion of the assembly people themselves.

"It is necessary that all of us further heighten our awareness that we are performing a vital service in one of the nation's most ambitious and most challenging adventures—to land men safely on the sur-

face of the moon.

"In the coming months we will take new pride in our role in the historic Apollo missions," Ryan declared.

The Electronic and Space Systems plant in recent years has built a quantity of test models of the Landing Radar systems, which have undergone successful environmental and flight tests.

Now the actual flight hardware is in production, and must be delivered entirely without defects. A unique opportunity for service and job satisfaction is presented to Ryan employees by the company's vital role in the U.S. moon program.

RADAR PIVOTAL UNIT IN LANDING CONTROL SYSTEM

America's commitment remains firm—before 1970, the Project Apollo astronauts will be launched toward the moon, will orbit, and then assisted by a Ryan Landing Radar System, softly touch down on the lunar surface and after performing programmed functions, will return safely to earth.

Where does Ryan's Lunar Landing Radar system fit into this seemingly impossible dream?

The Ryan system will first cast its "eyes" on the moon's rugged face from an altitude of approximately 50,000 feet while the descending Lunar Module is traveling at about 3,870 miles per hour.

By feeding altitude and velocity measurements into the LM Guidance Computer and into the astronauts' cockpit displays, the Ryan radar will be the pivotal element in the automatic "closed loop" landing control system. It helps brake the LM to a near-zero velocity hover above the

(Continued on Page 3)

Astronaut Inspects Ryan Radar Electronic Assembly



ELECTRONIC ASSEMBLY FOR RYAN LANDING RADAR is inspected by Neil Armstrong, right, Apollo astronaut, during recent visit to Electronic and Space Systems plant. Briefing was by Ned Olthoff, left, Program Manager, and C. J. Badewitz, Director of Engineering.

Production Of Lunar Space Flight Hardware Begins



COMPONENTS OF RYAN LANDING RADAR, on which fabrication has been started of actual space flight hardware for Lunar Module destined for the moon, are examined in Electronic and Space Systems plant "clean room" by, left to right, Paul Melton, Test Assembly Supervisor; Ned Olthoff, Program Manager; and Lloyd Proctor, Test Engineer.

RYAN RADAR TO HELP CONTROL LUNAR LANDING

(Continued from Page 2)

landing site before settling the vehicle gently on the moon.

The radar system itself is made up of two assemblies: the antenna assembly, which is affixed on the underside of the LM descent stage, and the electronic assembly, which is inside one of the electronic bays within the descent stage.

Both assemblies contain densely packaged electronic units—advanced solid-state power supplies, highly sensitive frequency trackers, tiny integrated circuits mounted in specially designed Ryan "flat-pack" modules. All metal parts are of lightweight, dip-brazed magnesium. The antenna case is made of honeycombed aluminum. A thin coat of vacuum-deposited aluminum and narrow stripes of white thermal paint cover the front of the antenna's transmitting and receiving arrays.

LUNAR LANDING SYSTEM WORK AT ALL THREE PLANTS

With the Ryan Electronic and Space Systems plant as the focal area of production of the Lunar Module Landing Radar system, several other departments in the Lindbergh Field and Kearny Mesa plants have been contributing vital services in this program.

The responsibility of building the transformers and reactors was assigned to Department 822-03, Magnetic Assembly, at Kearny Mesa.

In the main plant, the following departments have been or are participating in the project:

Department 130, Machine Shop—electrical discharge machining, milling, and finish machining of slots and pockets in the antenna arrays.

Department 151, Metal Products—assembling and dip brazing of wave guides for the antenna arrays.

Department 123, Plastics—bonding of honeycomb to skins and panels in fabrication of various structures and detail parts.

Department 276, Materials and Process Laboratories—development of machinery and procedures for applying the entire

LM Final Assembly Has Extra Reason For 'Zero Defects'



RENEWED MOTIVATION TOWARD "ZERO DEFECTS" ACHIEVEMENTS, provided by production of actual space flight hardware in Lunar Module Landing Radar program, has led to a monthly "Builds Better" award—its third—for Department 896-02, LM Final Assembly, Electronic and Space Systems plant. First shift employees are pictured above and second shift workers below, with Robert H. Guyer, Manufacturing Manager, at left, presenting plaque. In photo above, supervisory personnel at right are, left to right, Robert L. Dorsch, new Manufacturing Superintendent, and D. A. George, Foreman. Positions are reversed in photo below.



thermal finish; development and installation of equipment to dip braze magnesium hybrids and radar antennas; development of a corrosion protection system for magnesium parts to prevent interference with electronic transmissions through the wave

guides or antennas; assistance in miniaturization of cordwoods; devising techniques for conformal coating of cordwood modules; and development, with casting vendors, of highly exotic, clean grade of K1A cast magnesium.

SPECIAL AWARD FOR SUSTAINED LOW DEFECTS

A special award for sustaining an extremely low level of defects has been earned by employees of Department 253, Model

147 Major Subassembly.

This is the first department in the main plant to receive the special "Builds Better" banner which has been flown beneath Old Glory atop the administration building.

Only one other department has received such an honor—Department 822-02, Electrical Harness Assembly, which still has possession of the "Builds Better" banner at the Kearny Mesa plant.

Calendar pads and notebooks were presented to each employee as individual symbols of recognition.

In a message of congratulations, William J. Wiley, Vice President-Plant Operations, declared:

"You and your 'Builds Better' teammates have established a remarkable quality record over a long period of time.

"Such a record can be attained only through the efforts of all individuals . . . The Ryan Aeronautical Company does appreciate the high quality of work you and your teammates have achieved on the Model 147 program."

RADAR UNDERGOES INTENSIVE TESTS

A wide-ranging series of tests has demonstrated the efficiency and reliability of the Ryan Landing Radar system that will help guide the astronauts' Lunar Module to a soft landing on the moon's surface.

Test models utilized in simulated moon landings have successfully proved the thermal design efficiency. Temperatures ranged from minus 360 degrees F to plus 2300 degrees F, while inside the antenna's electronic compartments, temperatures remained within the desired range of 0 to 160 degrees F.

Radar system flight performance is being tested in a continuing series of helicopter and jet flights at Holloman Air Force Base, N.M., with highly satisfactory results, according to test officials. The rate of descent, hover, and other maneuvers are being performed to simulate the actual moon landing.

Department 253 Earns 'Builds Better' Banner



SUSTAINED LOW LEVEL OF DEFECTS has won for Department 253, Model 147 Major Subassembly, the special "Builds Better" banner—first department in the main plant to receive this honor.

Department 100 Wins Its First Monthly Award



FIRST MONTHLY "BUILDS BETTER" AWARD has been won by Department 100, Fabrication, main plant. Presentation of plaque was made to both shifts by O. W. "Bill" Kupilik, Manager of Manufacturing, who spoke of the increasingly close tolerances required in sheet metal work. Tillie Mansir and Estella Kramer received plaque for first shift employees, above, while Mildred R. Swauger represented second shift workers, below.



RYAN AERONAUTICAL COMPANY
P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

AUGUST BULLETIN

VOL. 2, NO. 9

RYAN AERONAUTICAL COMPANY

AUGUST 18, 1967

RYAN LANDING RADAR FOR LM-1 IS DELIVERED

LM Landing Radar system P-14, destined for installation on the first Apollo Lunar Module to be launched into space, was delivered to Radio Corporation of America representatives early this month

as production for the actual "flight hardware" was stepped up at the Electronic and Space Systems plant.

P-14 will go aboard Lunar Module 1. The mission will be an unmanned check-out of spacecraft subsystems. Date of launching has not been announced, but is likely before the end of this year.

At the same time, the P-18 Landing Radar was scheduled for shipment in mid-August. This system and the P-19 Landing Radar—on schedule for delivery in November—may be used on other unmanned flights or will be back-up radars for future manned missions.

Two LM Landing Radars were in final assembly and six were in fabrication this month at Ryan Electronic and Space Systems.

The two in final assembly are Landing Radars P-19 and P-27. The latter, P-27, is the Lunar Module Landing Radar system that has been designated as the first "manned spaceflight hardware."

The six radars in fabrication are production systems P-30, P-32, P-34, P-36, P-38 and P-40, according to Don Callard, project administrator.

Callard said each system is tracked closely through manufacturing and test cycles. Status of each component and subassembly is noted at midnight of each reporting day. There are 11 subassemblies in the LM Landing Radar electronic assembly, and four electronic subassemblies in the antenna. Also, each of the ten primary magnesium parts of the antenna are monitored daily.

Need For Perfection Emphasized In Apollo Program



MANNED

SPACE FLIGHT HARDWARE



USE EXTREME CARE



LIVES DEPEND ON YOUR PERFECTION

THEME OF LUNAR MODULE LANDING RADAR SYSTEM "BUILDS BETTER" PROGRAM is proclaimed in the message above, reproduced on posters, labels, cover sheets inserted in instructional planning books and other displays as production accelerates in numerous Ryan departments.

Double Honor Won By Engineering Support Department



HONORED FOR EXTREMELY LOW LEVEL OF DEFECTS (as indicated by Quality Performance Progress Chart) during second quarter of 1967 as well as month of June at the Electronic and Space Systems plant was Department 896-03, Engineering Support. The double award—quarterly and monthly—in the "Builds Better" program was presented by Robert H. Guyer, Manufacturing Manager, to department employees.

'ZERO DEFECTS' ACHIEVED IN COMPLEX JOB

An outstanding "Zero Defects" performance has been credited to draftsmen and assemblers in the production of extremely complex printed circuit boards at the Electronic and Space Systems plant.

Seven multi-layer and 5 single-layer boards were fabricated for the Model 610 computer interface unit, a portion of a

digital Doppler inertial navigation system for use on fixed wing aircraft.

Despite the fact this was one of the most complicated projects ever undertaken at the Electronic and Space Systems plant, it was accomplished without a single error. Roger M. Wiggans, assistant group engineer, was in charge of drafting, and George Felix, foreman of Department 896, Space Electronics, directed fabrication.

The circuit boards were produced for the first prototype of the navigation system, for which Ryan is making the Model 533 Doppler, as well as the Model 610 computer interface unit.

Employees responsible for this remarkable record were lauded for their errorless production, which required no rework and resultant loss of time.

PRODUCTION TIME SAVED BY REDESIGN

A redesign proposed by Sam Vernetti, liaison engineer, has resulted in saving of production time and reduction of chances for error in a Firebee project.

The objective was to eliminate excessive sealing time, and to aid in achieving a pressure tight forward equipment compartment.

Originally, the compartment door was made with an inner and outer skin spot-welded together. The inner skin was corrugated with holes in the corrugations to allow for sealing compound. At times, so much compound was needed that it almost equalled the weight of the door.

Vernetti's redesign consisted of moving the corrugated inner skin back inside the original outer periphery rubber seal, thereby eliminating the necessity of sealing the detail door itself. The rubber seal is now the only area of the door which must be pressure-tested.

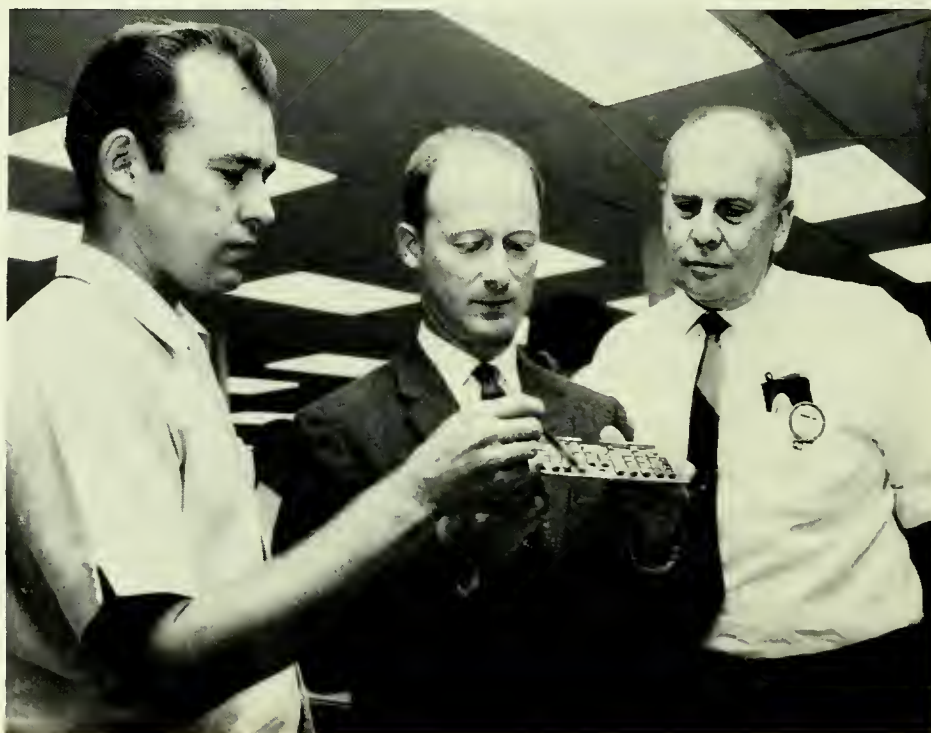
Printed Circuit Boards Completed Without Error



PERFECT PERFORMANCES BY DRAFTSMEN AND ASSEMBLERS have been achieved in production of complex printed circuit boards for a new project at Electronic and Space Systems plant.

Team that assembled the boards is pictured above in Department 896-03, Engineering Support—left to right, Evelyn Medearis, Velma Howell, Sylvia Haight, Ann Hise, Joyce Eade, and Clara Evans, all electronic assemblers, utility.

Drafting personnel comprised Tom Marenta, John Cook, Carl Halterman, Dave Hill, Dick Hollenback, Barry Miller, Tom Packer, Dan Watts, Jim Whitmoyer, Jack Lowery, and Ken Shocklee. Shown in photo below with Roger Wiggans, center, assistant group engineer in charge of the drafting phase, are Carl Halterman, at left, design draftsman, and Jack Lowery, at right, checker.





MANNED

SPACE FLIGHT BULLETIN

NEW EMPHASIS ON INDIVIDUAL WORKMANSHIP

With work on "manned spaceflight hardware" underway at Ryan on the Landing Radar system for the Apollo Lunar Module, new emphasis is being placed on the perfection of individual workmanship.

Significantly, the management magazine DATA noted that the Apollo Review Board "made the findings that the Apollo fire (that claimed three astronauts' lives) was caused by a series of individual design decisions, sloppy installation work, and deficiencies in program management."

The magazine added in its staff analysis:

"Not said, however, was that the outstanding culprit undoubtedly was laxity itself, laxity which had resulted from success, and which, like a cancer, had spread throughout NASA installations and industrial production lines.

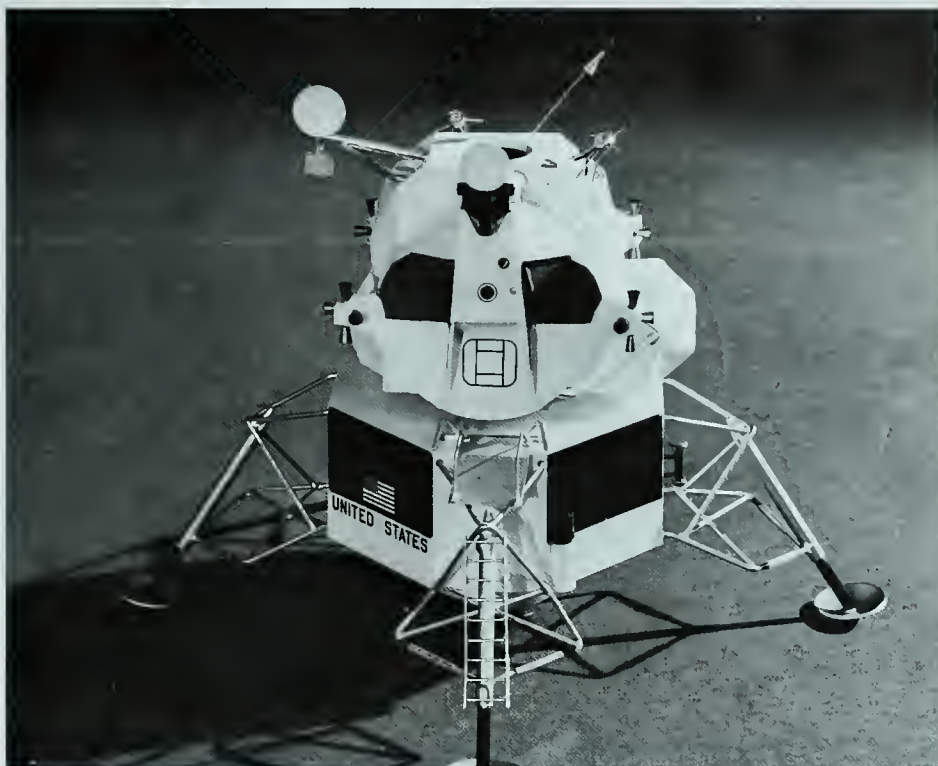
"NASA, to its credit, has accepted the major share of the responsibility . . . NASA has forged ahead with . . . new reliability standards and checkout, a strengthening of its management team, both internally and in the industry, all with the firm resolve that such an accident will not happen again."

TINIEST DETAIL OF VITAL IMPORTANCE IN SPACE PROGRAM

The importance of perfection in the tiniest detail of workmanship, particularly in the space program, was reemphasized in a survey of possible causes of the mishap which resulted in sudden failure last month of Surveyor IV just 2½ minutes before it was to land on the moon.

The most frequent speculation by in-

Ryan Landing Radar Responsible For LM's Moon Landing



MODEL OF LUNAR MODULE which will make first manned Lunar landing with American astronauts is pictured. Ryan Electronic and Space Systems plant has begun fabrication of Landing Radar Systems which will be responsible for soft landing of the capsule on the moon.

vestigators has been that the spacecraft exploded as a braking rocket reduced its speed for a soft landing. Engineers have concluded, according to press reports from Washington, that there may have been a break in a power cable, wiring bundle or solder joint; a rupture in the casing of the main braking rocket, or failure of a nitrogen or helium container holding gas to pressurize Surveyor's fuel tank.

National Aeronautics and Space Administration officials still do not discount a chance that Surveyor IV actually landed safely but failed to return close-up pictures of the moon because of a transmitter malfunction.

Surveyor I and Surveyor III made successful landings—Surveyor I on June 1, 1966, and Surveyor III last April 19. Surveyor II suffered a rocket misfire and crashed. Three more Surveyor unmanned

spacecraft, carrying Ryan lunar landing systems similar to those aboard the first four Surveyors to help effectuate soft landings on the moon, will be launched this year and early in 1968 to explore the lunar surface preparatory to manned flight in the Apollo Lunar Module.

Each successful Surveyor mission adds a new dimension in radar navigation for the Ryan Landing Radar System, which was the first space navigator to guide a spacecraft to a soft landing on a celestial body — with Surveyor I.

Among the other numerous firsts achieved by the Ryan system was its ability to accurately capture and track radar return signals from the surface of the moon, proving the accuracy of pre-launch mathematical calculations of a radar reflectivity model for the lunar surface.

RYAN PROJECTS SUPPORT MOON LANDING GOAL

Project Apollo has its origins in a decision made in 1961.

At that time, the man-in-space program was expanded beyond the limited Mercury effort to a full-scale attack on the problems of manned flight to the moon and planets.

The impetus for the decision came from a series of Soviet achievements which were capped by the successful launch, orbit and safe return of Russian Cosmonaut Yuri Gagarin.

The world had seen the Soviet Union achieve man's first flight in space.

On May 26, 1961, the late President John F. Kennedy laid the Soviet challenge before the American people.

He urged the nation to commit itself to the goal of landing a man on the moon and returning him safely to earth before the decade was out. He asked for a careful examination of the commitment: "There is no sense in desiring that the United States take an affirmative position in outer space unless we are prepared to do the work and bear the burdens."

Ryan Aeronautical Company has been privileged to perform a role in support of this goal. Ryan solar panels powered the Ranger camera-carrying moon shots. Ryan radar altimeters measured altitudes out to 310 miles during the Saturn launch evaluation program. Ryan's landing radar sensors have aided in landing two Surveyor spacecraft at potential Apollo landing sites.

And now the biggest job of all: production of the Lunar Module Landing Radar.

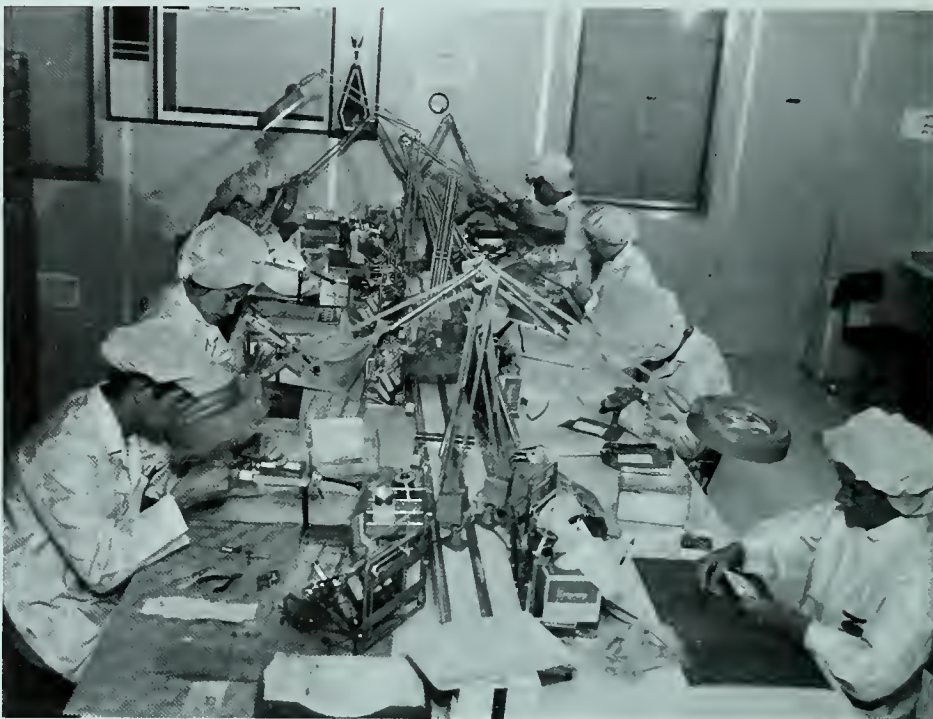
NUMEROUS 'ZERO DEFECTS' MESSAGES

Reminders that "Zero Defects" must be achieved in production of Lunar Module Landing Radar systems are visible in all areas where work is being conducted on these vital units.

Posters in conspicuous locations proclaim the message: "Manned Space Flight Hardware—Use Extreme Care—Lives Depend On Your Perfection."

Also bearing the urgent appeal for perfect workmanship are labels and tags on handling equipment, kit boxes, etc. as the production program moves into high gear.

'Clean Room' Center Of Landing Radar Production



PRODUCTION OF LUNAR MODULE LANDING RADAR systems to be used in actual "flight hardware" carrying the first Project Apollo astronauts to the moon is under way in "clean room" at Ryan Electronic and Space Systems plant.

MAN IS NEEDED IN SPACE EXPLORATION

Many of the critics of the nation's plans to land men on the moon suggest that the objectives of space exploration and research can be achieved by robots, rather than by men.

Dr. Homer E. Newell, associate administrator for Space Science and Applications, NASA, pointed to the philosophy which gave life to the Apollo program to counter this viewpoint.

"The impetus of the lunar program is derived from its place in the long-range U.S. program for exploration of the solar system," Dr. Newell remarked. "The heart of that program is man in space, the extension of man's control over his physical environment."

In the early stages of lunar exploration, the simplest observations can be made by remote control, as the U.S. is doing with the Surveyor series.

"In later stages, when more difficult experiments are attempted the trained human observer brings to the supervision of these experiments the ability to deal with unforeseen difficulties and to respond to unanticipated opportunities," Dr. Newell noted.

He emphasized that at these advanced stages of lunar exploration, automatic in-

struments must be designed with great complexity, at a heavy price in reliability and cost of development, to achieve even a crude imitation of human sophistication and flexibility.

"The balance of cost and reliability then tips in favor of the human participant, expensive though it is to bring him to the scene," Dr. Newell said.

He judged the science we gain from space is the "return to the taxpayer for his investment," that it is the "equivalent of the gold and spices recovered from earlier voyages of exploration."

'Oranges' 3000 Miles Apart

To most Ryan employees, it may seem that the ideas and products going on at Ryan Electronic and Space Systems are pretty "far out."

Well, they really are. Here's an example of the void of space: if the sun is the size of an orange in San Diego, then the next nearest star is another orange 3000 miles away in New York. This is the emptiness of space—a distribution of oranges 3000 miles apart.

RYAN ANTENNA MUST SURVIVE SPACE EXTREMES

The terribly harsh environment which the Apollo Lunar Module must penetrate as it travels to the moon dictates the need for "Zero Defects" in production of such sensitive components as the Ryan landing radar antenna.

Biting cold, searing sunlight, blazing rockets, the vacuum of deep space — all will be experienced by the thermally coated antenna, which has already withstood the most realistic mission simulation possible on earth.

A temperature range of more than 2600 degrees has been applied in an important series of tests that duplicated the heat and cold which the antenna must survive during the 90 to 100-hour flight when it alternately faces the sun or the cold of the Lunar Module's vacuum-locked shadow. During the actual landing maneuver, the antenna will experience the heat of the high-energy exhaust gases from the descent rocket engines, plus the re-radiated heat from the lunar surface.

"In the last several seconds, we will have a buildup of the so-called 'plume impingement heating,' which is equivalent to the heat of five suns," Lester C. Lemke, Jr., Ryan thermophysics group engineer and manager of the solar vacuum tests, explained.

"In spite of these conditions, the landing radar must feed accurate information on the module's speed and altitude into the LM guidance computer."

Temperatures extended from a liquid nitrogen-cooled minus 320 degrees F, to an electrically induced high of 2,300 degrees F, according to J. R. Iverson, Vice President for Ryan Electronic and Space Systems, builders of the radar system.

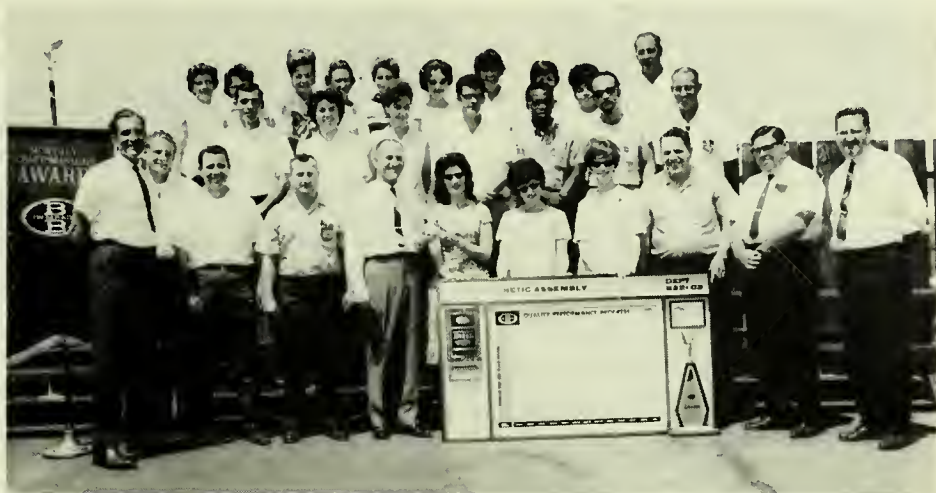
Ryan thermal specialists collaborated with Boeing Aircraft Company to conduct the series at the Boeing Space Center, Kent, Washington. A 20-foot high, 10-foot diameter, ultra-clean space chamber was equipped with lamps and mirrors to create the deep space environment.

"Our purpose in this three-month series of tests has been to prove out the effectiveness of the Ryan-designed thermal control system, and to insure reliability of the radar's electronic components," Iverson continued.

He said thermal control is the key fac-

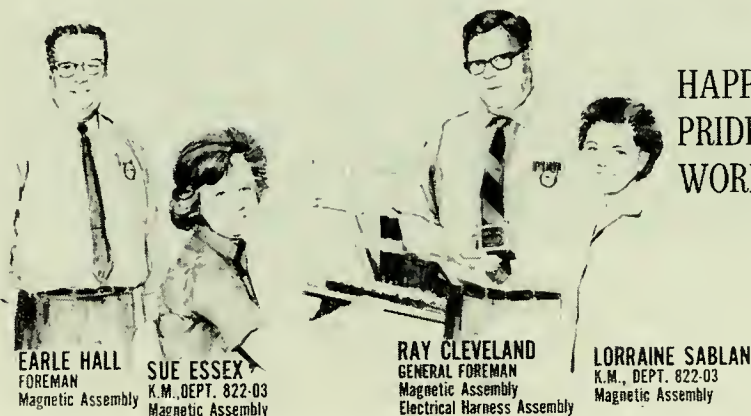
(Continued on Page 4)

Quarterly, Monthly Awards Won By Department 822-03



DOUBLE WINNER of both quarterly and monthly (June) "Builds Better" awards at the Kearny Mesa plant was Department 822-03, Magnetic Assembly. Dorothy Kandler holds quarterly award plaque presented by Howard Engler, Director of Manufacturing.

By coincidence, "Builds Better" posters went up this month throughout all three plants spotlighting the pride taken by Department 822-03 employees in their workmanship (below). Representing the department in this poster were Ray Cleveland, General Foreman; Earle Hall, Foreman; and Sue Essex and Lorraine Sablan.



EARLE HALL
FOREMAN
Magnetic Assembly

SUE ESSEX
K.M., DEPT. 822-03
Magnetic Assembly

RAY CLEVELAND
GENERAL FOREMAN
Magnetic Assembly
Electrical Harness Assembly

LORRAINE SABLON
K.M., DEPT. 822-03
Magnetic Assembly

Best Record Achieved For Second Quarter Of 1967



BEST "ZERO DEFECTS" RECORD FOR SECOND QUARTER OF 1967 in main plant was established by Department 252, Drone Assembly, which won this distinction for the first time. Plaque denoting quarterly award was received by Doris Broady on behalf of fellow employees from Howard Engler, Director of Manufacturing.

RYAN ANTENNA MUST SURVIVE SPACE EXTREMES

(Continued from Page 3)

tor toward radar mission success in the Apollo soft landing.

"This is because the antenna is fixed externally beneath the Lunar Module descent stage," Iverson explained. "It must survive the full range of launch and space-flight environments enroute to the moon, and then must function during the landing maneuver."

The antenna itself is a computer-designed cluster of velocity and altitude sensors. Metal structural parts are of dip-brazed magnesium, which is extremely lightweight. The structure and its mylar thermal shroud are covered by a thin coat of vacuum-deposited aluminum, a vapor metallizing process which is accomplished in a specially adapted chamber at the main plant.

As a final thermal control, patterns of white paint are carefully sprayed over those portions of the slotted array antenna facings through which waveguide runs.

"This combination of paints and aluminumized surfaces furnishes the proper balance of absorptance and emissivity of the solar energy," Lemke said. "A tiny, Ryan-designed 25-watt heater inside the antenna maintains component temperatures within a prescribed range of 0-160 degrees F."

"The realistic tests at Boeing have demonstrated that our approach to the thermal control problem is sound. The Apollo landing radar system is ready for the real thing — a manned landing on the moon."

Monthly 'Builds Better' Award Won For Second Time



FOR THE SECOND TIME, a monthly "Builds Better" craftsmanship award has been won by Department 822-05, Returned Parts-Mod Assembly, Kearny Mesa plant, for reduction of defects. Georgia A. Enhelder, received plaque from Paul Vissat, Superintendent, Manufacturing, on behalf of the department. At right are Jack Eddy, General Foreman, and Harry Wisner, Foreman.

Department 154 Achieves Top Performance In Main Plant



TOP "BUILDS BETTER" PERFORMANCE DURING JUNE in main plant was registered by Department 154, Models 124A, 147, and 166 Sub Assembly. H. E. Dukes, Manager of Assembly, paid tribute to employees in speech at award presentation ceremony. At accompanying drawing, transistor radios were won by R. V. Alipranti, Jim Purvis, G. L. Lathrop, V. P. Rogers, V. L. Feldman, D. E. Wagle and R. N. Troxel.



RYAN BUILDS BETTER
WITH
ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

SEPTEMBER BULLETIN

VOL. 2, NO. 10

RYAN AERONAUTICAL COMPANY

SEPTEMBER 20, 1967

RYAN RADAR RELIABILITY PROVED AGAIN

Successful soft landing of the trouble-plagued Surveyor 5 on the moon September 10 was proof again of the "Zero Defects" reliability of the Ryan landing radar system, which had less than one minute and only 4,400 feet in which to work.

The Ryan RADVS (Radar Altimeter and Doppler Velocity Sensor) corrected the attitude of the rapidly descending spacecraft, squared it off with the landing site, shut off the engines at 14 feet, and dropped it gently on the moon's Sea of Tranquility, only two miles from the programmed target.

"Up until the final seconds, it was an abnormal landing sequence," J. R. Iverson Vice President-Ryan Electronic and Space Systems, said. "But under control of the Ryan radar, the Surveyor 5 spacecraft swung into the pre-programmed descent profile. By the time the engines shut off and the craft touched down, it seemed almost routine."

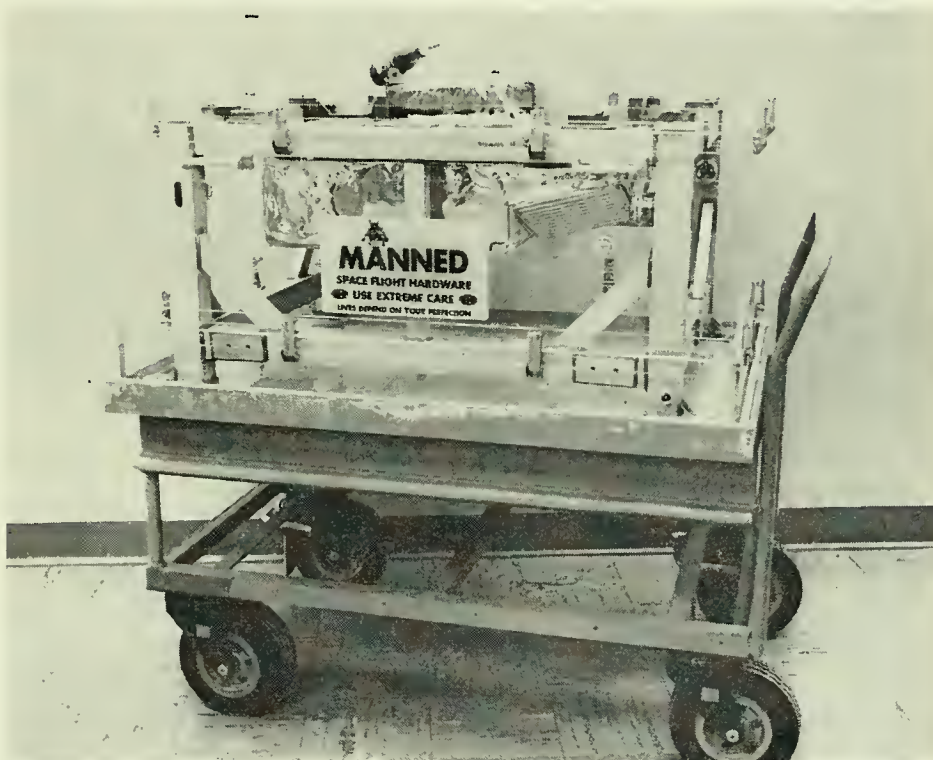
Earlier problems had been far from routine, however. Because of a leak, not enough helium pressure remained for a normal landing. An overnight computer analysis determined that by delaying the time of ignition of the main retro rocket, the landing sequence could be reprogrammed to bring Surveyor 5 in for a "tight," split-second soft landing.

For the Ryan radar, this reprogramming meant that the radar could be expected to take control of the spacecraft at 4,400 feet above the lunar surface, rather than the normal 35,000 to 40,000 feet.

It also meant that, instead of having the usual two minutes to correct spacecraft attitude and achieve a descent rate of five feet-per-second before engine shut-off and touchdown, the Ryan radar would have less than 60 seconds to bring the

(Continued on Page 4)

Special Handling Fixture Protects Radar Antenna



EXTREME CARE called for in label—a feature of the Ryan "Builds Better" program—is exemplified by this special handling fixture, a rubber-wheeled cart on which is mounted a large, clear plastic container to protect the Ryan Lunar Module Landing Radar antenna during final assembly.

ANTENNA GETS 'KID GLOVE' TREATMENT

Protection of the Ryan Lunar Module Landing Radar antenna—a vital component of the system that will make possible a soft landing on the moon by American astronauts—is assured in the Electronic and Space Systems facility by a specially designed handling fixture.

When the antenna enters the final assembly stage, it must be guarded against contamination as well as mechanical damage in implementing the Ryan "Zero Defects" program.

A rubber-wheeled cart is fitted with a special adapter to accept a large, clear plastic container inside which the antenna

rests in an atmosphere purged with dry nitrogen. The cart can be moved from place to place within the plant on low pressure air wheels that prevent shock damage.

The container allows viewing from any angle, thus enabling workers to ascertain its complete contents. When a sub assembly is to be installed, the upper lid is removed, the part is added, the interior of the container is repurged and the lid is restored. The same procedure is followed when the assembly must be removed for vibration or other environmental tests.

(Continued on Page 2)

MAINTENANCE OF TOOLS VITAL TO 'ZERO DEFECTS'

Keeping the thousands of small portable power tools in Ryan's inventory in perfect working condition is an essential element in maintaining "Zero Defects."

Two men preside over the task of maintaining the hand-held electric or air tools, such as rivet guns, chipping hammers, screwdrivers, nutsetters, impact wrenches, tappers, grinders, drills, etc.

They are Al Lopez, industrial engineering analyst, and A. "Sandy" Sandoval,

repairman, whose responsibility covers approximately 5,000 tools.

Many of the tools are so expensive that it would be uneconomical to store backup tools. Thus, when such a tool is out of commission, production is affected immediately. Lopez and Sandoval have the task of keeping tools in constant service while maintaining minimum of spare parts inventory.

"We have to keep a constant check on our supply of spares to avoid overloading bins with parts that might not be needed for years," Lopez points out.

Considerable savings are effected by salvaging parts from wornout tools for use as spares in repairs. Also, wherever possible, further savings are realized by re-conditioning tools, rather than purchasing new tools.

Into the tool repair shop flow tools from off-site Ryan bases in this country and overseas, as well as from every fabrication department in Ryan's three San Diego plants.

ANTENNA RECEIVES SPECIAL TREATMENT

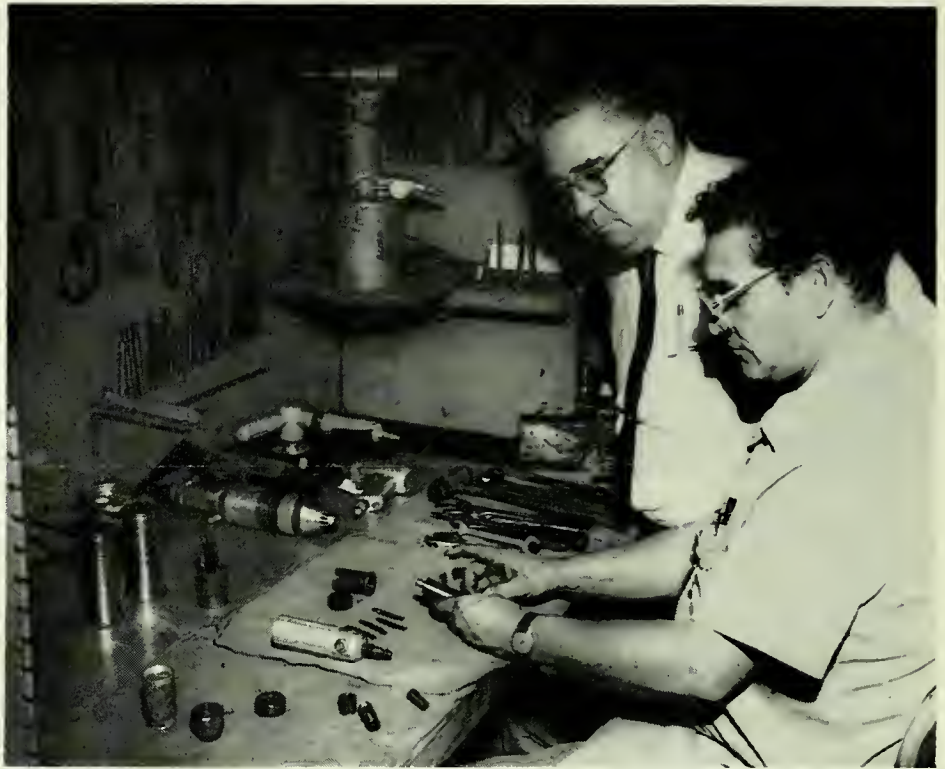
(Continued from Page 1)

Continuous protection is thus provided the antenna's critical thermal-coated finish.

A task force designed and built this fixture under the direction of Ron Fredericksen, Supervisor, Industrial Engineering,

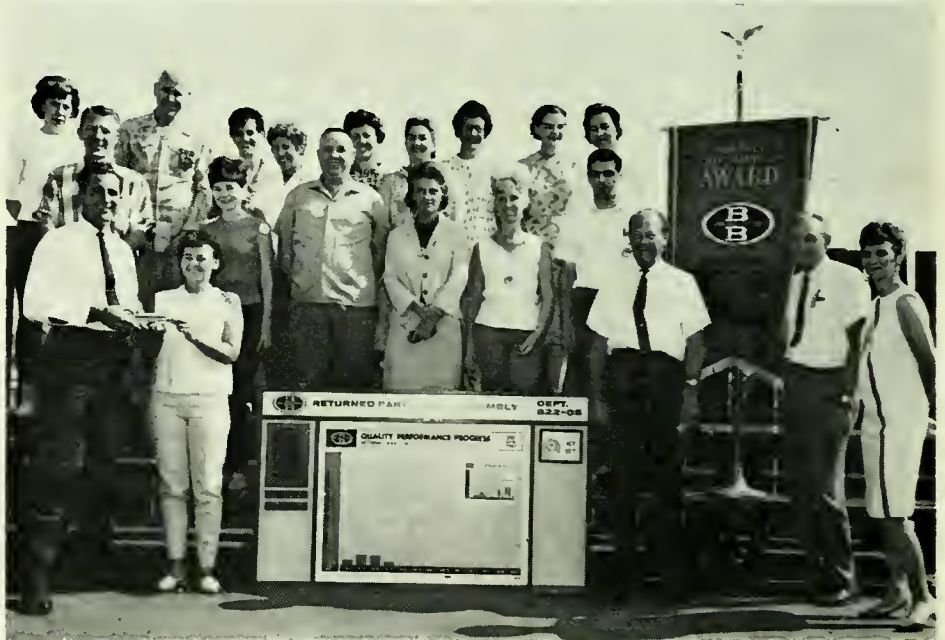
(Continued On Page 4)

They Keep Thousands Of Portable Tools In Service



THOUSANDS OF PORTABLE POWER TOOLS are kept in working condition by these two Ryanites, Al Lopez, standing, industrial engineering analyst, and A. "Sandy" Sandoval, repairman, as vital contribution to "Builds Better" program.

Department 822-05 Wins Monthly Award Third Time



THIRD MONTHLY "BUILDS BETTER" AWARD was won in July by Department 822-05, Returned Parts-Modification Assembly, Kearny Mesa plant. Supervisory personnel, headed by Paul Vissat, left, Superintendent, Manufacturing, honored employees at award ceremony. Esther Thayer represented co-workers in receiving additional rung for award plaque from Vissat.



MANNED

SPACE FLIGHT BULLETIN

RYAN AERONAUTICAL COMPANY

SEPTEMBER 20, 1967

GEMINI PROGRAM HAILED AS TRAIL BLAZER

America's first Apollo astronauts on the moon will be hailed as the pioneers of a new era in man's exploration of the unknown.

But an impressive tally of space assignments has already been achieved by U.S. spacemen in the Gemini Program, completed last November ahead of schedule.

In Gemini, the National Aeronautics and Space Administration (NASA) has done its

“homework” in preparation for the big test: Project Apollo and the landing of U.S. astronauts on the moon.

With the job of supplying the landing radar system to guide the Apollo Lunar Module safely to a soft landing on the moon, Ryan is serving a vital role in the success of the manned mission.

And at Ryan, too, the “homework” phase is virtually over. Radar systems for use in the actual Apollo moon landings are now in production in key departments throughout the company's three plants.

A recap of a number of the significant achievements of the Gemini program points up how much has been learned about how well man can live and work in space.

With the completion of the ten 2-man missions of the Gemini series, total space-flight experience for U.S. astronauts reached 2,000 man-hours. New records were set for speed and altitude above the earth—850 miles up.

A two-week Gemini flight proved that man can work effectively during the planned eight-day Apollo flight to the moon and back. Rendezvous and docking of two space vehicles in orbit—essential to the safe return of the astronauts—is another contribution, along with the accomplishment of precision maneuvers, orbital changes, and guided re-entry from orbit to on-target splash-downs.

Gemini ground crews were able to launch two space vehicles on the same
(Please turn page)

Pioneer Astronaut Helped Prepare For Moon Mission



GEMINI ASTRONAUT who “moved up” to the Apollo program is Neil Armstrong, command pilot of Gemini 8, the hair-raising mission in which the Gemini docked with an “angry alligator” Agena. After tumbling through space, Armstrong and Astronaut Ed White made an unscheduled splashdown in the Pacific.

GEMINI PROGRAM HAILED AS TRAIL BLAZER

(Continued)

day, at the precise moment required for the astronauts to attain rendezvous on their first orbit. Mission Control Center at Houston was able to maintain control of three vehicles—a Gemini and two Agena boosters—in the same mission.

Extravehicular activity (EVA) was a prime objective realized in the Gemini series. The Apollo astronauts will move from the Command Module into the Lunar Module, and once on the moon, will walk about the landing site, setting experiments and collecting lunar surface samples.

More than 50 scientific, medical and technological experiments were successfully conducted by the Gemini crewmen. Dramatic photo experiments showed large areas of the earth, land masses, cloud formations, and seas. Gemini cameras captured the first total eclipse of the sun seen from space, the airglow of the earth's horizon, and other near-earth space phenomena never seen by man before.

Such a list points up the importance of every piece of spaceflight hardware which goes into a manned system.

It cannot be over-stated: for the Apollo astronauts to live and work safely "out there," maximum performance is required from each spacecraft system.

Lives really do depend upon YOUR perfection in workmanship.

RADAR FOR LM-3 SHIPPED TO RCA

Ryan Electronic and Space Systems engineers shipped Lunar Module Landing Radar P-18 to RCA in late August, marking another milestone in the LM "manned spaceflight hardware" production program.

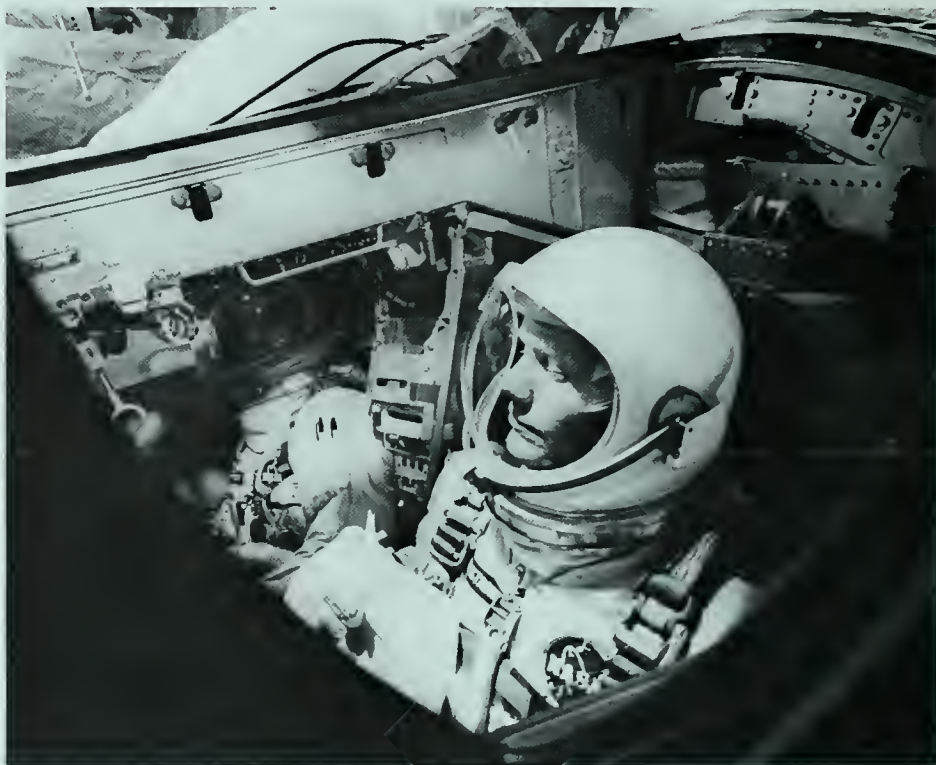
P-18 will "see" space on Lunar Module mission 3, according to Ryan LM program officials. LM-3 will be a manned, earth-orbital mission, with a launch scheduled perhaps during 1968.

J. R. Iverson, Vice President-Electronic and Space Systems, sent a congratulatory memo through all LM departments, commending the Ryan LM team for its quality performance and delivery on P-18.

Meanwhile, the Ryan radar system des-

(Continued on Page 3)

Astronaut's Experience Being Applied To Apollo



IN GEMINI 8 COCKPIT, Armstrong gained invaluable experience which is being applied to Apollo. Now responsible for astronaut training, Armstrong recently visited Ryan to observe flight test of the Ryan Flight Data System for NASA's Apollo Lunar Landing Training Vehicle, and to see LM radar production.

A New Breed Of Pioneers

Reprinted From San Diego Union

More than a century ago hardy pioneers who were in the vanguard of the westward movement of civilization were crying "California or bust."

Today, in much the same vein, another breed of pioneers is saying with equal determination, the moon by 1970 or "bust." Like all pioneers those in the space program face extremely difficult problems which at times make them ask themselves if the effort is worth the reward.

Today, as the United States of America stands on the threshold of the moon, the man-made problems surrounding space are growing. The public attitude toward space is becoming blasé after 16 manned flights in just six short years.

The necessary cost of the war in Vietnam, about \$25 billion a year, unfortunately is causing many to ask whether some of the money can't be taken from the space program. The same question also is being asked as the annual social

and poverty programs grow to equal the cost of the Vietnam War.

The public attitude was reflected in Congress. The House trimmed \$309 million from the \$5.1 billion request of the National Aeronautics and Space Agency. The Senate recommended \$248 million less than the request. Many congressmen who formerly championed the U.S. space program turned away from it during the process.

And NASA's image has been gravely affected by the disastrous Jan. 27 fire in which three astronauts lost their lives on the ground. The fire set the Apollo moon program back by about half a year and added \$75 million to its cost.

Now it is estimated that it will cost \$22.5 billion to put an American on the moon, a figure at which the public balks even in these days of astronomical budgets.

And that is just the beginning. Beyond the moon there are Mars, Venus and other

(Continued on Page 3)

SPACEFLIGHT ASSIGNMENTS SET FOR RADAR

Spaceflight assignments for Ryan-built Lunar Module Landing Radar Systems have firmed up, according to E. Bruce Clapp, space radar program manager.

Clapp said it appears that NASA plans one unmanned earth-orbital mission, using LM radar P-10. This will be followed by two manned earth-orbital missions, using LM radar P-14 on the first, and LM radar P-18 on the second.

"This better clarifies for us which radar NASA might use in the first moon landing," Clapp said. "We can say now it appears that P-27 will be the first radar available for installation on the LM which makes the first manned moon landing. P-30 and P-32 and perhaps later production units will also be available to NASA, however."

Ned L. Olthoff, space systems programs manager, added that specific unit assignments are difficult to determine.

"It is to the advantage of the LM program that there will be a number of radar systems to choose from for any given mission. Each system is just as important as the next. Perfection in workmanship and performance is necessary for each system — unmanned missions, manned missions, moon landers and spares," he said.

RADAR FOR LM-3 SHIPPED TO RCA

(Continued From Insert Page)

ignated as the first "manned moon-landing" system, P-27, moved through the vacuum aluminizing process in the Process Labs at the Ryan Main Plant, and into final section level checkout. P-27 will be aboard LM-4, which is scheduled to be the first Lunar Module to try for the moon landing in the Apollo moon program.

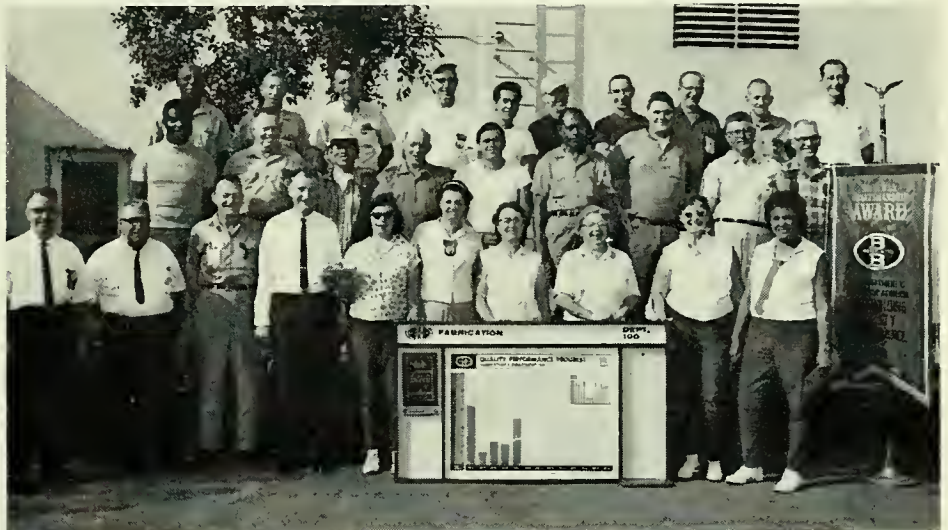
Don Callard, engineering administrator, said all remaining Lunar Landing Radar systems were moving through production as scheduled.

After delivery of P-27 in mid-October, Ryan will be moving LM radars "out the door" at the rate of one a month, Callard said.

Department 100 Honored For Reduction In Defects



SHARP REDUCTION in defects per 100 manhours of production enabled Department 100, Fabrication, to win the monthly "Builds Better" award for July in the main plant. O. W. "Bill" Kupilik, Manager of Manufacturing, is shown presenting new rung for award plaque to employees of the first shift, above, and second shift, below. This was the second monthly honor earned by Department 100.



A New Breed Of Pioneers

(Continued From Insert Page)

planets, some within the sights for 1970. Earth oriented applications of space are innumerable. They include studies of weather, the ocean, the terrain, communications, astronomy, space and biophysics.

From the military and national security standpoint, space is the high ground of the cosmos and no nation can afford to ignore it. The United States must excel in this respect.

Today we have to some extent faltered on the space program, unfortunately. It is reflected in the public mood and the lowering appropriations.

Perhaps the pioneers of a little more than a century ago also faltered, wondering if the journey on which they were embarking was worth the perils and the cost.

A look at the United States of America they helped carve out today answers that question with an emphatic "yes."

Yesteryear's pioneers were conquering earth and their rewards were great. Today we are talking about conquering infinity and the rewards are proportionately greater.

As a nation the United States cannot afford not to spend what is necessary to keep our supremacy in space.

SOLAR PANELS CONTINUE SPACE PERFORMANCE

Solar panel structures on Mariner spacecraft continued high-reliability performance during the past month.

Mariner 5, launched in June, passed the halfway mark in its 128-day trip toward Venus. An October 19 rendezvous with the mist-shrouded planet is planned, according to Jet Propulsion Laboratory officials. After passing Venus, Mariner 5 will pass closer to the sun than any previous space probe, presenting a great challenge to the Ryan solar panels in terms of structural integrity, thermal control and reliability of the dielectric surfaces.

Both Mariner 5 and its older "sister" Mariner 4, aided JPL and NASA scientists in mid-August. Near-perfect alignment of the two spacecraft, the sun and the earth gave the unprecedented opportunity for gathering solar radiation data from different points in space. Again, the Ryan-built solar structures performed invaluable service.

'Kid Glove' Treatment

(Continued from Page 2)

Electronic and Space Systems. It is another example of the effort required to insure complete reliability, thorough elimination of errors, in the continuing Ryan "Builds Better" program.

Father, Son Honored Simultaneously At Pt. Mugu



FATHER AND SON were honored simultaneously recently at Pt. Mugu Naval Missile Test Center, where they are members of the Ryan flight test group in the Firebee jet target drone program. Lowell E. Leonard, received 5-year service pin from John Burhans, Ryan base manager, while his father, George E. Leonard was presented "Ryan Builds Better" individual certificate of merit by Robert Lankard, maintenance supervisor, for outstanding error-free performance. Both are master mechanics, engineering flight test.

RYAN RADAR EFFECTS SURVEYOR SOFT LANDING

(Continued from Page 1)

craft under control.

Chief difficulty in winning control was for the radar to swing the spacecraft from its approach angle of 47 degrees, around to a straight-up, vertical landing.

"It was a condensed landing sequence. The Ryan radar had to do its job quickly and well," said E. Bruce Clapp, program manager. "It was tight, but we pulled it off."

JPL's Al Hibbs, who narrates the mission sequence over closed circuit television at

the Jet Propulsion Laboratory, Pasadena, said that a one second miscalculation in timing of the command for retro rocket ignition would have been disastrous.

"With the spacecraft travelling at 9,000 feet-per-second a command sent one second too early would use the remaining fuel too rapidly, leaving the spacecraft at an altitude of 9,000 feet or more. One second too late would have driven the spacecraft into the moon. We had a margin of .2 second or less," Hibbs said.



...WITH ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

OCTOBER BULLETIN

VOL. 2, NO. 11

RYAN AERONAUTICAL COMPANY

OCTOBER 27, 1967

PERFECT FLIGHT RELIABILITY IS ACHIEVED

Ryan contractor service personnel at Tyndall Air Force Base, Florida, achieved 100% flight reliability during the month of August for Firebee target missions.

Taking over from the 4756th Air Force Maintenance and Drone Control Squadron

on July 3, the Ryan team under Billy Sved, veteran Ryan base manager, has piled up an impressive record of drone operations.

Initially scheduled to phase in to complete target flight, control, and maintenance operation by late October, Sved's technicians were fully operational more than a month ahead of schedule.

In less than three months of handling the total Firebee target service at Tyndall, the Ryan crew has mounted more than 64 Firebee missions without an operational loss, a record in itself for a new contractor service facility.

Ryan participation in Tyndall target operations stems back to 1958 when Ryan technicians helped support Firebee missions for Air Force Weapons Meets, as well as continuing target requirements.

Establishment of Sved's crew marks the first time, however, that Ryan contractor service has been employed by the Air Force on a full-time basis.

Operating under the direction of Colonel Thomas D. DeJarnette, Commander of the 4756th Air Defense Wing, Ryan personnel will provide Firebee target mission support for advanced training in the supersonic F-106 Delta Dart Jet interceptors, missile and rocket firing exercises and training of air controllers.

Firebee operations will also support continuing needs for target missions involving weapon system evaluations and training conducted by nearby Elgin Air Force Base and its Tactical Air Command units.

Ryan personnel at Tyndall are giving
(Continued on Page 4)

Ryan Field Crew Beats Schedule At Tyndall AFB



RYAN FIELD SERVICE CREW at Tyndall Air Force Base, Fla. has achieved impressive reliability record, in Firebee target missions, and has taken over full flight, control and maintenance operations one month ahead of schedule. Officer standing at left is Capt. D. L. Henson, Air Force liaison officer.

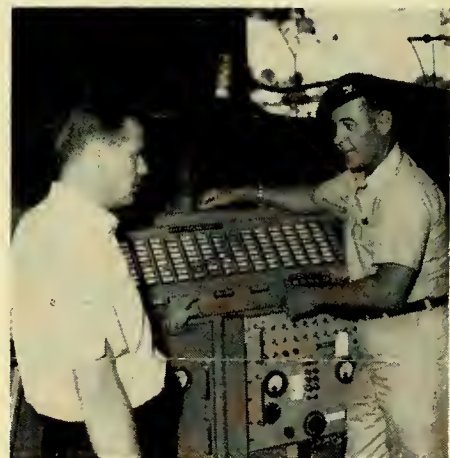
'BB' SUPPORTER GIVEN NEW POST

One of the most ardent supporters of the Ryan "Builds Better" program has interrupted a 28-year career here and has started an important new industry assignment with a subsidiary.

He is Robert H. "Bob" Guyer, popular Manufacturing Manager of the Ryan Kearny Mesa and Electronic plants in recent years, who late in October began duties as Operations Manager at Wisconsin Motor Corp., Milwaukee, a subsidiary of Ryan's majority-owned Continental Motors Corp.

Wisconsin Motor Corp., an expanding firm with approximately 2400 employees, is a leading producer of heavy-duty air-cooled engines for farm and industrial equipment, and has begun manufacturing military engines. The company last year acquired two plant sites as additions to two existing production facilities.

At a farewell party for Guyer at the Sands Hotel, he was cited particularly for his backing of the Ryan objective of attaining "zero defects" in all operations at



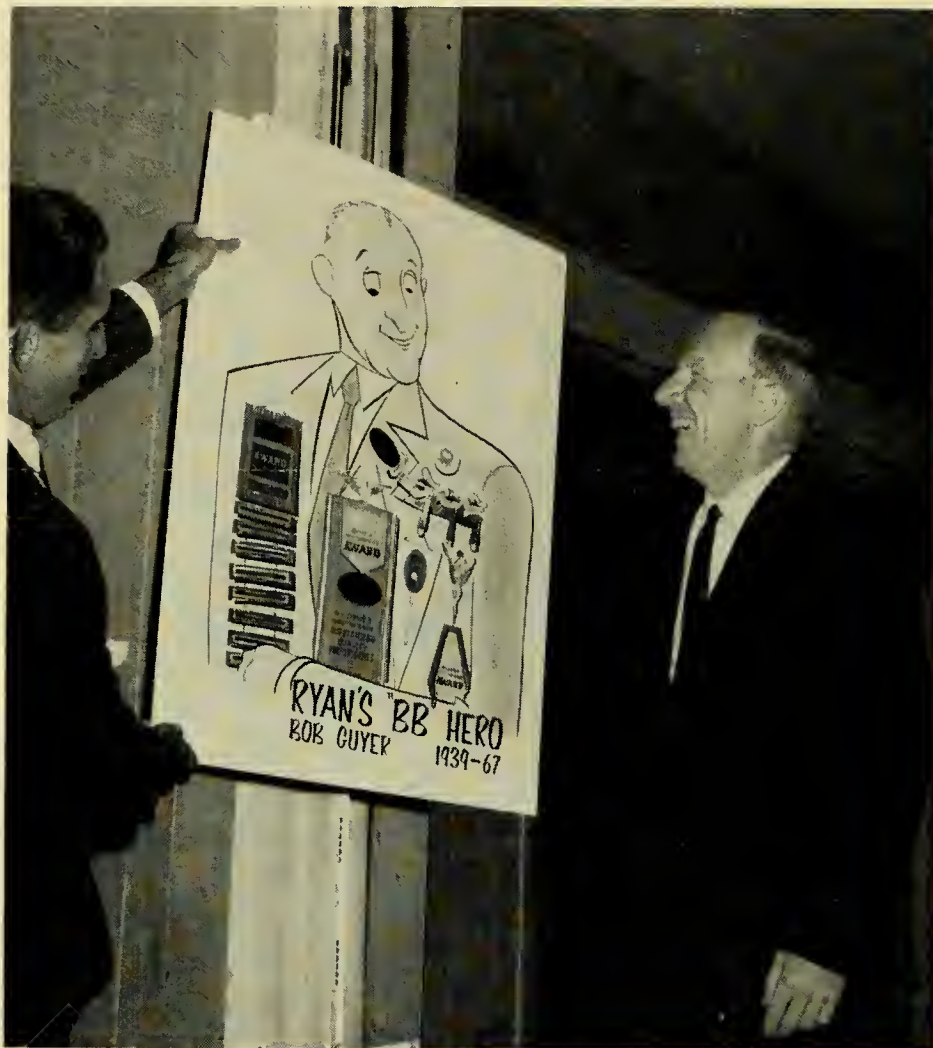
COMMANDER of 4756th Air Defense Wing at Tyndall AFB, Fla., Col. Thomas D. DeJarnette, confers with Billy Sved, Ryan base manager, at Firebee flight systems checkout console.

the Kearny Mesa and Electronic and Space Systems plants.

A special citation presented him by L. M. Limbach, Executive Vice President-Plant Operations, expressed appreciation for his "unrelenting support of the 'Ryan Builds Better' program. His outstanding leadership in promoting the principles and practices of Ryan's 'Zero Defects' program has served as a constant inspiration to his fellow employees to strive for error-

(Continued on Page 2)

Longtime Ryanite Honored On Departure For New Post



TRIBUTE TO BOB GUYER as Ryan's "Builds Better" Hero was paid in recent farewell party honoring former Manufacturing Manager at Kearny Mesa and Electronic and Space Systems plants. Guyer, who has been appointed to an executive position with Wisconsin Motor Corp., Milwaukee, a subsidiary of Ryan's majority-owned Continental Motors Corp., was presented bemedalled caricature by Paul Vissat, Superintendent, Manufacturing. Caricature was designed by Jack Salley, "Builds Better" program assistant, and was drawn by Dick Noland of Graphic Arts.

GUYER ENDS 28-YEAR CAREER AT RYAN

(Continued from Page 1)

free work."

Guyer's career at Ryan began 28 years ago as a student in the Ryan School of Aeronautics. Continuing his self-improvement, he took U.C.L.A. extension courses in engineering and management and specialized training for the position of assistant foreman on major aircraft components.

At Ryan, Guyer has instructed new personnel in aircraft manufacturing techniques, and has held several supervisory posts, including foreman with responsibility for production of components and

assemblies of manifolds, tailpipes and jet engines; assistant superintendent, with responsibility for production of major aircraft, and DC-8 pylon package and engine building.

He also was project superintendent of plastics and the "Flex Wing" program prior to being given responsibility for total manufacturing effort on earth electronics and space projects, including the Lunar Module and Surveyor programs at the Kearny Mesa and Electronic and Space Systems plants.

Guyer takes to Wisconsin Motor Corp.

RYAN SOLAR PANEL UNITS IN VENUS FLY-BY

The efficient performance of America's Mariner 5 spacecraft as it flew by Venus this month and began sending to earth volumes of tape-recorded data about the planet's atmosphere highlighted the success of the Ryan "Builds Better" program.

Mariner 5 is equipped with Ryan-built solar panel structures which harness the sun's energy for the electric power required to perform the vehicle's numerous functions.

Importance of perfect workmanship in production of these structures is emphasized by the fact that 100 percent reliability is required in deploying the panels correctly in space.

A Ryan spokesman pointed to the need for infinite accuracy in production techniques exercised by all personnel in the project, ranging from engineers to machine operators and sheet metal fabricators.

Ryan has built solar panel structures for the entire Mariner series, and is now developing lighter, larger solar arrays to meet the needs of deep space probes of the future. The "Builds Better" concept is being applied to this new challenge.

Unlike the rigid Mariner panels, the new arrays roll out and away from the spacecraft, exposing more panel area to generate more electric power than ever before.

The first space-ready model of the deployable array is now undergoing environmental tests and sterilization. Nearly 20 feet long and three feet wide, it offers 50 square feet of solar surface area, or 13 watts of solar electric power per pound. Each Mariner 5 panel is approximately 11 square feet.

Ryan recently won a second contract for design of an even larger deployable array that will expose 250 square feet and provide up to 30 watts per pound.

Both developmental contracts were awarded Ryan by the Jet Propulsion Laboratory, Pasadena.

experience in various plastics fabrication and honeycomb core laminations in projects involving antennas for the Surveyor and Mariner programs; and in metal bonding for Mariner spacecraft. He has also been responsible for production of Ryan Firebee specialized plastic components.



MANNED

SPACE FLIGHT BULLETIN

RYAN AERONAUTICAL COMPANY

OCTOBER 27, 1967

NEW RYAN RADAR INSTALLED ON LUNAR TRAINER

A second-generation Ryan radar navigation system has been installed on NASA's Apollo Lunar Landing Training Vehicle (LLTV), at Bell Aerosystems, in Buffalo, N.Y.

America's Apollo astronauts will receive 40 hours training with the LLTV, rehearsing for their soft landings on the moon. The spider-legged "touch-down trainer," which

rockets to altitudes of 1000 feet and to speeds as great as 65 mph, is lifted by a gimbaled rocket engine that gives the astronaut the feel of the moon's gravity, which is one-sixth of the earth's.

Called the LLTV Flight Data System, the Ryan sensors are a pulse radar altimeter and a doppler radar velocity sensor. Accurate, continuous measurement of velocity—forward, backward and sideways—and of altitude are made by the sensors. Altitude and velocity indicators are also supplied by Ryan for the trainer's cockpit displays.

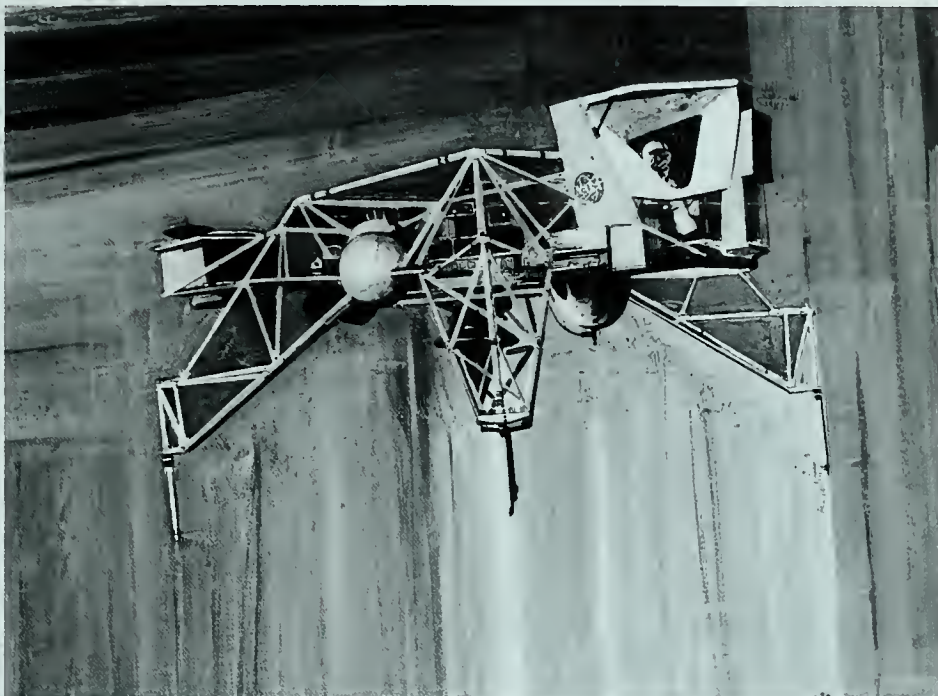
J. R. Iverson, Vice President-Electronic and Space Systems, said major refinements have gone into the Ryan system from its early cousin, the Ryan AN/APN-97 radar navigator, which was modified in 1963 for flight testing of the Lunar Landing Research Vehicle (LLRV) at Edwards AFB, Calif. Ryan and Bell teamed on the LLRV also, proving the flight concept of the unusual vehicle.

"The radar sensors operate much the same way they would on a helicopter," Iverson noted, "allowing the training vehicle to descend vertically and hover, fly sideways, and perform other maneuvers that may be needed to soft-land the Apollo Lunar Module on the moon."

He said the main improvements involved use of smaller electronic components to save weight and increase reliability, and in selection of a flat, slotted planar array receiver-transmitter to replace the two "dish" antennas used on the research vehicle.

This new antenna is similar in design to

Astronauts Get 'Feel' Of Moon Landing In This Vehicle



ARTIST'S CONCEPT OF LUNAR LANDING TRAINING VEHICLE (LLTV), on which second-generation Ryan radar navigation system has been installed to enable Apollo astronauts to rehearse for soft landings on the moon in 40-hour training program.

the antenna built by Ryan for the landing radar system on the Apollo Lunar Module. Both are "clusters" of slotted array receivers and transmitters. The LLTV radar goes a step further, Iverson pointed out, by housing the radar signal processing electronics within the same "box" as the antenna. The LM electronic assembly is a separate unit.

Accuracy of the LLTV radar system was demonstrated in a NASA-supported flight test program held at the Ramona Raceway in San Diego County. Paced by an instrumented van on the raceway track, a helicopter equipped with the LLTV Flight Data System flew at various test speeds and altitudes. NASA Program Manager for the LLTV, James Bigham, observed the flights, and Apollo Astronaut Neil Armstrong personally flew the flight test helicopter during a visit to Ryan facilities in San Diego.

"Test results were quite satisfactory," Iverson said. "Astronaut Armstrong was very pleased with the simplicity of the cockpit indicator display and with the reli-

able performance of the radar system."

Bell Aerosystems delivered the first of its three LLTVs to NASA Manned Spacecraft Center, Houston, this month. The two earlier LLRV test craft have been adapted as trainers also, making five trainers available to the Apollo program.

RYAN PROPOSES SMALLER FIREBEE

High reliability of the Firebee has led Ryan engineers to propose a somewhat smaller version of the standard jet target drone for use by the U.S. Army in missile and automatic weapons training.

The "Builds Better" program will be relied on to increase cost effectiveness through overall reductions in procurement, maintenance and operating costs of the proposed new project. The smaller Firebee would perform at 175 to 600 knots speed, and at altitudes of 400 to 40,000 feet.

COMPLETION OF RADAR FLIGHT TESTS NEARS

Flight evaluations of the Ryan-built lunar landing radar for the Apollo Lunar module are nearing completion at Holloman Air Force Base, New Mexico.

The Ryan radar was installed on a NASA SH-3A helicopter for the first series of flights. The helicopter simulated the vertical descent and hover maneuvers anticipated for moon landings of the



Apollo LM. In mid-October, the second phase is due to start in which a NASA T-33 jet will simulate the high speed approach and start of the descent.

Both installations called for the LM landing radar (PP-7) to be encased in plastic radome and mounted beneath the aircraft. The electronic assembly was installed inside the aircraft with monitoring equipment.

Theodolite cameras circling the test site record each flight. Results have been good, according to Test Supervisor George Warr. Field Engineer Joe Wahnish has accompanied each flight and monitors ground support equipment.

Systems Analyst Robert Harrington is attending meetings with Grumman and NASA representatives to discuss flight test data.

RADAR SYSTEMS IN FINAL PRODUCTION

Four landing radar systems are entering final stages of production this month as production of sensors for the Apollo Lunar Module continues at a fast pace.

Radars P-19 and P-30 are in final assembly test, while P-27 is in section check-out. P-32 has begun final fabrication.

Ned Olthoff, space programs manager, said NASA has named P-30 as the system which will be the first available for use in the actual lunar landings. Earlier, P-27 had been designated. P-30 is due for delivery near the end of November, he said.

At the same time, Grumman contract officials notified Ryan that NASA has decided on two unmanned space flights of the Lunar Module before a manned mission. E. Bruce Clapp, LM-Surveyor program manager, said LM-1 will use Ryan radar P-10 and LM-2 will use P-14.

Helicopter Simulates Lunar Landings In Radar Tests



DESCENDING OVER TEST SITE at Holloman Air Force Base, New Mexico, NASA SH-3A helicopter, equipped with Ryan landing radar, simulates descent of Apollo lunar module on surface of moon.

THREE RYAN RADARS IN TEST PROGRAM

Three Ryan radars have supported the LM flight test evaluations at Holloman AFB.

Besides the LM landing radar itself, Ryan's Radar Scatterometer was used in a portion of the tests to compare reflectivity measurements with the LM radar. And the helicopter, a Sikorsky SH-3A which originally saw duty as a Navy anti-submarine warfare helo, is equipped with a Ryan AN/APN-130 Doppler Radar Navigator.

SENSOR APPLIED TO 'AIR CUSHION'

Ryan electronics engineers have applied the velocity sensor portion of the Lunar Landing Training Vehicle (LLTV) flight data system to use aboard air cushion vehicles.

In an informal evaluation, the sensor operated successfully on a Bell Aero Systems Company SK-5 ACV on Lake Erie. Ryan engineer Bill Cook said the sensor



RYAN LANDING RADAR is shown encased in black plastic radome for flight test in NASA helicopter and jet aircraft.

is the first radar navigation system to demonstrate measurement of forward and drift velocity for an air cushion vehicle.

Interest in the air-riding vehicle is high following combat trials in South Vietnam.

Department 123, Plastics, Wins Monthly 'BB' Award For First Time



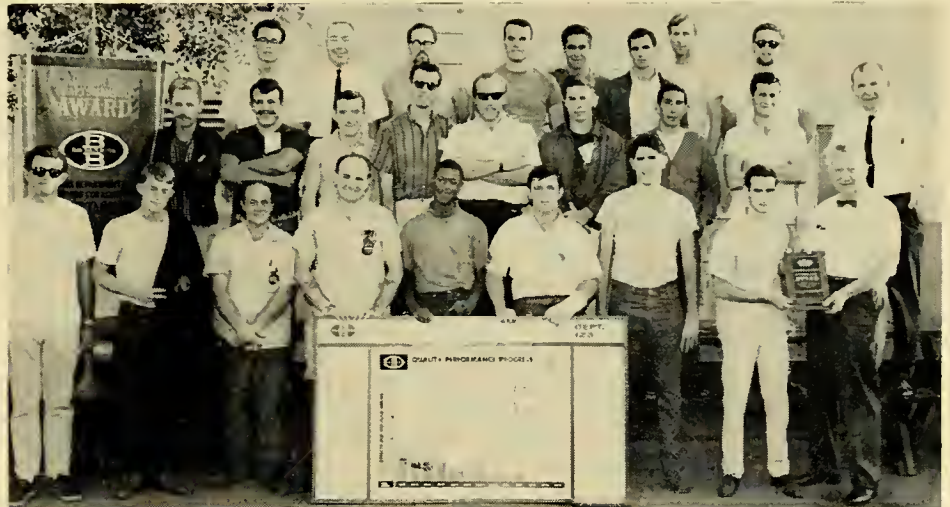
REMARKABLE RECORD of reduction of production defects has won for Department 123, Plastics, main plant, its first monthly "Builds Better" award. The department, which has undergone considerable expansion recently, qualified for this recognition by a reduction of 2.7 defects per 100 manhours in a one-month period. H. E. "Pappy" Dukes, Manager of Assembly, paid tribute to employees of all three shifts (first shift, above; second shift, below; and third shift, at bottom of page) at award presentation ceremonies. Quality Performance Progress chart shows steady reduction in defects.



PERFORMANCE OF DEPT. 123 LAUDED

Employees of one of the fastest-growing departments in all three Ryan plants — Plastics, Department 123 — have earned high praise from H. E. "Pappy" Dukes, Manager of Assembly, for their remarkable performance in reducing production defects.

With a reduction of 2.7 defects per 100 man-hours over a 30-day period, Department 123 recently earned its first "Builds Better" monthly award. During the past year and a half, Plastics has quadrupled in size to more than 160 employees today.



NEATNESS IN ALL AREAS IS SOUGHT AT RYAN

A successful "Builds Better" program consists of many elements, not the least of which is good housekeeping within the shop and office areas of the plant.

Officials responsible for attaining the program's "Zero Defects" goal point out that this is more easily accomplished by workers who have pride not only in their craftsmanship but in the appearance of their job surroundings.

For the past two years, a general renovation and rearrangement of plant facilities has been under way at Ryan to increase general operating efficiency and to provide more comfortable and convenient conditions for employees. This will be extended to areas which have not yet been refurbished.

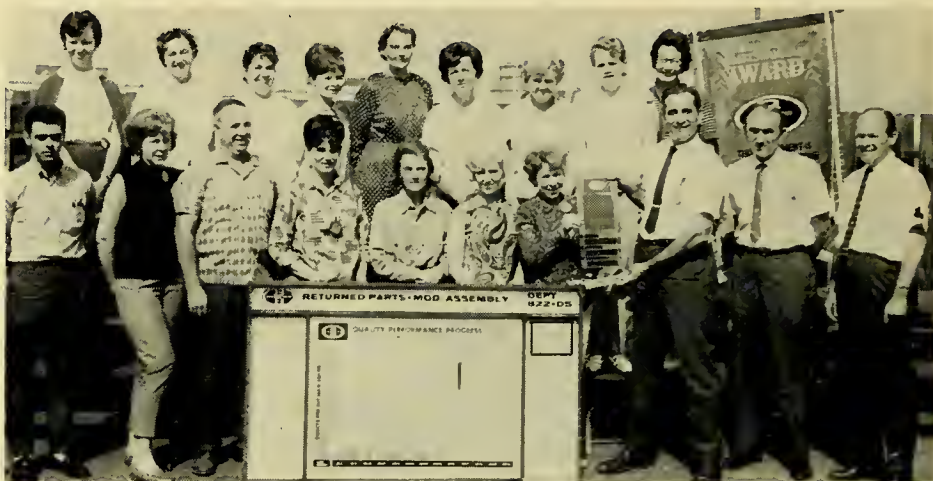
To maintain the neat, well-ordered appearance which is the objective of such a program, employees are urged to avoid careless discarding of used coffee cups, towels, etc. "Not only does good housekeeping improve production, but it provides the kind of impression we seek to create among customers visiting the Ryan plants," a company spokesman pointed out.

Perfect Flight Reliability

(Continued from Page 1)

confirming evidence of a demonstrated capability in military support through excellence in Firebee target support at Army, Navy and Air Force bases throughout the world.

Two Departments Honored In 'BB' Competition



FOR FOURTH TIME THIS YEAR, Department 822-05, Returned Parts Mod Assembly, Kearny Mesa plant, has been awarded a monthly "Builds Better" award for reduction of defects. Paul Vissat, Superintendent, Manufacturing, praised employees for "gung ho" spirit.



THIRD MONTHLY "BUILDS BETTER" AWARD has been earned by Department 895-01, Model Shop, Electronic and Space Systems plant. Bob Dorsch, Manufacturing Superintendent, presents new rung to T. W. Tabor, on behalf of department, to be placed on "Builds Better" plaque. Dorsch lauded Ryan "Builds Better" program as the best of any "Zero Defects" plan he has had personal experience with in other aerospace industry plants, from the standpoint of individual spirit of employee participants.



...WITH ZERO DEFECTS

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested



RYAN BUILDS BETTER

NOVEMBER BULLETIN

VOL. 2, NO. 12

RYAN AERONAUTICAL COMPANY

NOVEMBER 20, 1967

RYAN TEAM AT TYNDALL AFB WINS AWARD

Ryan's 57-man Firebee Field Service team at Tyndall Air Force Base, Fla., has been awarded the first "Perfection" plaque to be given under the Ryan "Builds Better" program.

The presentation occurred Nov. 14, at Tyndall, with Maj. Gen. Walter B. Putnam, Commander of the 14th Air Force, participating in the event.

Awarded for the achievement of 100 percent reliability in Firebee operations during the month of August, the "Perfection" plaque was accompanied by letters of commendation from T. Claude Ryan, Chairman of the Board, General Putnam and Colonel D. J. DeJarnette, Commander of the 4756th Air Defense Wing at Tyndall.

Ryan's team relieved the uniformed Air Force personnel of all Firebee operational-maintenance responsibilities last July 1.

(Continued on Insert Back Page)



FIRST "PERFECTION AWARD" ever made in the Ryan "Builds Better" program—the handsome plaque pictured above—was presented to the company's 57-man Firebee field service team at Tyndall Air Force Base, Fla. for achieving 100 percent reliability during an entire month of jet target drone operations.

Major Milestone Achieved In Firebee Production



SIGNIFICANT MILESTONE in production of Free World's most widely used jet target drone, the Ryan Firebee, was achieved this month in the San Diego plant with completion of the 2000th "bird" of the current BQM-34A configuration. Approximately 1,200 of an earlier generation of Firebees preceded this large group off the assembly lines. These high performance realistic "stand-ins" for the enemy have been produced by Ryan for the Air Force, Navy and Army for the past two decades, and their reliability is continually assured by the company's "Builds Better" program, to which attention was called, in the 2,000th roll-out, by the familiar "BB" insignia (foreground).

CHANGE CONSTANT FOR RYAN OLD-TIMER

By BOB BATTENFIELD

It is said that nothing is as constant as change. Mel Thompson—holder of Ryan Badge Number 9—has been riding herd on "change" during most of his more than 35 years with Ryan—a period of active service second only to T. Claude Ryan, company founder and Board Chairman.

Now manager of configuration control on the Apollo LM Landing Radar program at Ryan Electronic and Space Systems,

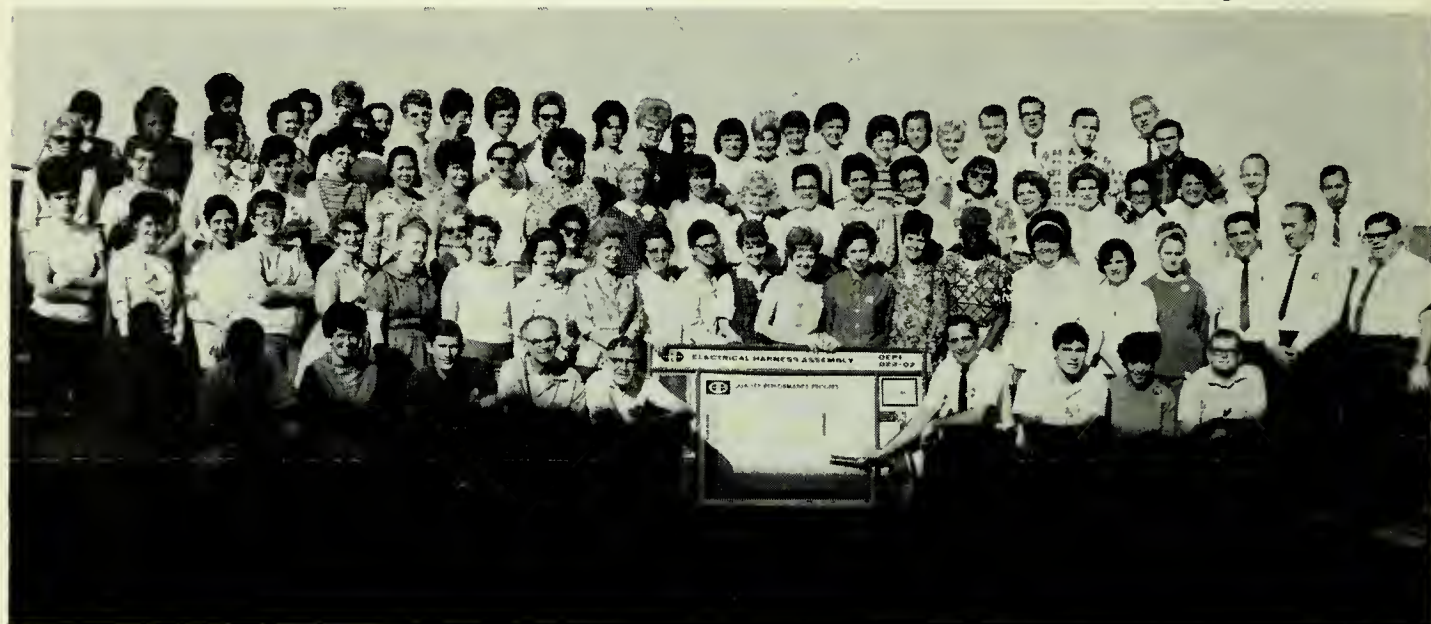
Mel is responsible for maintaining a complete record of all changes that are incorporated into the basic system design of the radar that will guide U.S. astronauts to soft landings on the moon.

Back in the Thirties, he was chief inspector on the Ryan ST monoplane trainer and the Ryan PT-22. For the famed Ryan Navion, Thompson was manager of spare parts, ordering and distributing world-wide.

"Now we have quality assurance and

(Continued on Page 2)

Dept. 822-02 Maintains Plantwide Lead With 9th Monthly Award



MAINTAINING ITS LEAD OVER ALL OTHER DEPARTMENTS in number of "Builds Better" monthly awards, Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, was honored for the 9th time recently when Paul Vissat, kneeling at right of chart, added a new rung to the department's plaque. Vissat recently succeeded Bob Guyer as Manufacturing Manager when Guyer assumed his new post as Operations Manager at Wisconsin Motor Corp., Milwaukee, after 28 years at Ryan. (Wisconsin Motor is a subsidiary of Ryan's majority owned Continental Motors Corp.) First shift employees are shown at top, and second shift workers are pictured below with Jack Eddy, the new Superintendent, Manufacturing, at Kearny Mesa, (kneeling).

CHANGE CONSTANT FOR OLD-TIMER

(Continued from Page 1)

quality control. Then it was simply 'inspector,' Mel recalls.

His first job with Ryan was in 1928, at the age of 21, when Mel taught instruments and airframe construction at the Ryan Ground School, part of the Ryan Flying School that operated from the Dutch Flats on Barnett Avenue. He rejoined the company in 1933, and has never left.

In the early Fifties, Mel was design change control manager working on Ryan programs associated with the B-47, KC-97, XV-5A, and XC-142.

With the start of production of the LM radar, Thompson moved up to the Electronics plant.

"Design change control on airframes was similar to configuration control in that we kept a record of every change made in the shop, just as we are doing now in LM," Thompson said. "But compared to space electronics, we worked to moderate precision on airframes."

He said tolerances on airframe parts ran 15-30 thousandths.

"With space electronics, we are achieving tolerances of one-half and one-quarter of 1/1000th of an inch. We are working



with minute components, building modules the size of matchboxes.

"What we have is a record of the growth of an electronic system that is extending the state of the art, creating a system to do a job that has never been attempted before. It is a real challenge," Mel declared.

Reliable hardware for the manned space-flight mission is the objective. "We want to insure quality all the way, that is the main effort," he pointed out.

His configuration records trace each component from vendor to module to sub-assembly to assembly. Each module carries its own "kit list" by which compon-

ents can be traced.

"In the event of any failure, NASA wants to trace back to locate the exact lot in which that component was purchased or manufactured," Mel explained. "Tests can determine whether other components in the same lot may fail."

For Ryan, "traceability" is unique to the Apollo program; not even Surveyor required such close control of components and changes.

"NASA gave us a broad outline," Mel said. "It was up to us to work out the detailed procedures."

Now that Ryan is building "manned

(Continued on Insert Back Page)



MANNNED

SPACE FLIGHT BULLETIN

RYAN AERONAUTICAL COMPANY

NOVEMBER 20, 1967

SATURN FLIGHT BRINGS U.S. CLOSER TO MOON

A "boiler-plate" Lunar Module—predecessor of an actual LM aboard which a Ryan-built landing radar system will be exercised electronically early in 1968—was carried by the mighty Saturn 5 rocket which achieved success this month in a dramatic lift-off and orbit of the earth in its first space test. The Saturn 5 will ultimately boost the three-part Apollo into flight toward the moon.

NASA officials said the payload of Apollo Command and Service Modules, and the

→
"boiler-plate" Lunar Module, totalling more than 6,000 pounds, was the heaviest ever placed in orbit around the earth, equalling the weight of all previous U.S. satellites combined.

Saturn 5 itself is 364 feet tall, and weighed 6.2 million pounds at lift-off from Cape Kennedy. All three stages burned and separated perfectly in the test.

NASA said five manned moon missions are planned for 1969. The first four will be lunar mission development flights or moon flight simulations. The fifth is the first designated for an actual lunar landing, with the Ryan radar system helping make possible a soft touchdown on the moon.

RYAN ASSISTS IN SURVEYOR SUCCESS

Targeted for a rugged lunar plain and given only a 50-50 chance of survival, Surveyor 6 successfully soft landed on the moon November 10 guided in its final moments by a Ryan landing radar.

Ryan's RADVS (radar altimeter and Doppler velocity sensor) took command of the descending spacecraft at around 30,000 feet and controlled it gently down the pre-

Mightiest Rocket Achieves Dramatic Space Feat



ON ITS WAY TO PAD 39 AT CAPE KENNEDY is the huge Saturn 5 moon rocket, most powerful space booster ever launched by either the United States or Russia. First test toward "man-rating" the system was successfully achieved November 9. North American Aviation is the prime contractor on Saturn 5.

programmed descent path to the landing. Strain gauges on the landing legs indicated the robot bounced a few inches on impact on the rocky highland in the moon's Central Bay (Sinus Medii).

T. Claude Ryan, Board Chairman, watched control consoles in the Jet Propulsion Laboratory during the final hour of flight, and met with Dr. William Pickering, direct-

or of JPL, and Dr. Lee A. DuBridge, President of the California Institute of Technology. J. R. Iverson, Vice President for Electronic and Space Systems, accompanied Mr. Ryan.

The company's RADVS system has helped place four Surveyor robot spacecraft on the moon. One more mission, Surveyor 7, is scheduled perhaps in January.

2 ASTRONAUTS TO 'FLY' LM IN THERMAL TESTS

Two Apollo astronauts will "fly" the Lunar Module soon in thermal vacuum tests that will include a check of the Ryan-built landing radar system.

Astronauts James Irwin and John Bull have been named to climb into the Lunar Module Test Article 8 (LTA-8) in the thermal vacuum chamber at the NASA Manned Spacecraft Center, Houston, to simulate the complete LM mission. It

will be the first opportunity for the astronauts to simulate the lunar landing in a space-like environment.

The Ryan landing radar is affixed to the descent stage of LTA-8, just as it will be on the actual moon landing module.

A Grumman Aircraft Engineering Corp. spokesman said the astronauts will "fly LTA-8 from the time it is injected into lunar orbit, during its descent to the moon's surface, and on its return to the Apollo Command Module."

Mission tests could run up to 150 hours, the spokesman said.

Irwin and Bull will wear new Apollo space suits. Temperatures will range in the mid-70s. Oxygen pressure will be about five pounds psi, as it will be in the actual lunar landing.

The vacuum chamber will simulate the cold, airless environment of space. Heaters will be turned on and off to simulate the firing of rockets and the heat of the sun.

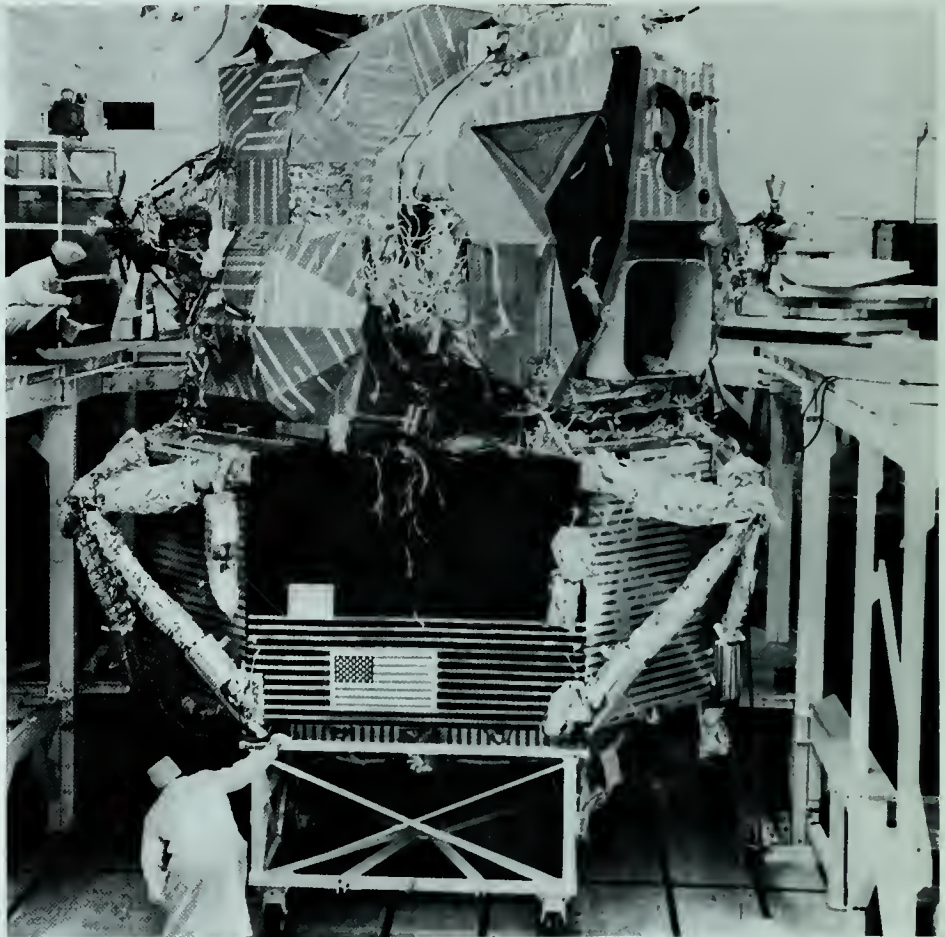
TV cameras and communication links will keep the astronauts in constant touch with the test monitors.

DELIVERIES OF RADAR UNITS DUE

Delivery of two more LM landing radar systems will occur before mid-December, according to LM project administrator Don Callard.

LM Radar P-27 this month was in section level check-out, and Radar P-30—designated as the first LM radar available to NASA for the first moon landing—was undergoing assembly and test.

Lunar Module Test Vehicle Ready For Thermal Testing



READY FOR THERMAL VACUUM TESTING at the Manned Spacecraft Center, Houston, is the Lunar Module Test Article 8 (LTA-8). Two astronauts will enter the module for a complete lunar mission simulation. Ryan's LM landing radar is beneath the LTA-8 descent stage.

CHANGE CONSTANT FOR RYAN OLD-TIMER

(Continued from Page 2)
spaceflight hardware" for the Lunar Modules which will make the actual lunar landings, the work of Mel Thompson and his staff, W. A. "Bud" Basnight and Meralee Carr, in configuration control has taken on added significance.

RYAN TEAM WINS AIR FORCE AWARD

(Continued from Page 1)
It also took over flight control and tracking duties.

General Putnam flew from his headquarters at Gunter AFB, Ala., to make the presentation. After the plaque was turned over to Col. DeJarnette, it was presented by the Tyndall commander to Billy Sved, Ryan Base Manager.

Witnessing the presentation, in addition



MEL THOMPSON
... with model of LM

to staff officers of the 4756th Air Defense Wing, were two Ryan representatives, Lloyd Ryan, Director, Aerospace Programs; and Frank C. Brtek, Manager, Target Operations.

DEPTS. 253-6 MAINTAIN LOW DEFECTS LEVEL

Some departments have such a consistently low level of defects that they don't qualify for the "Builds Better" monthly and quarterly awards.

This paradoxical situation arises from the fact that the special recognition is

given for marked improvement in performance, through sharp reduction in number of defects per 100 manhours.

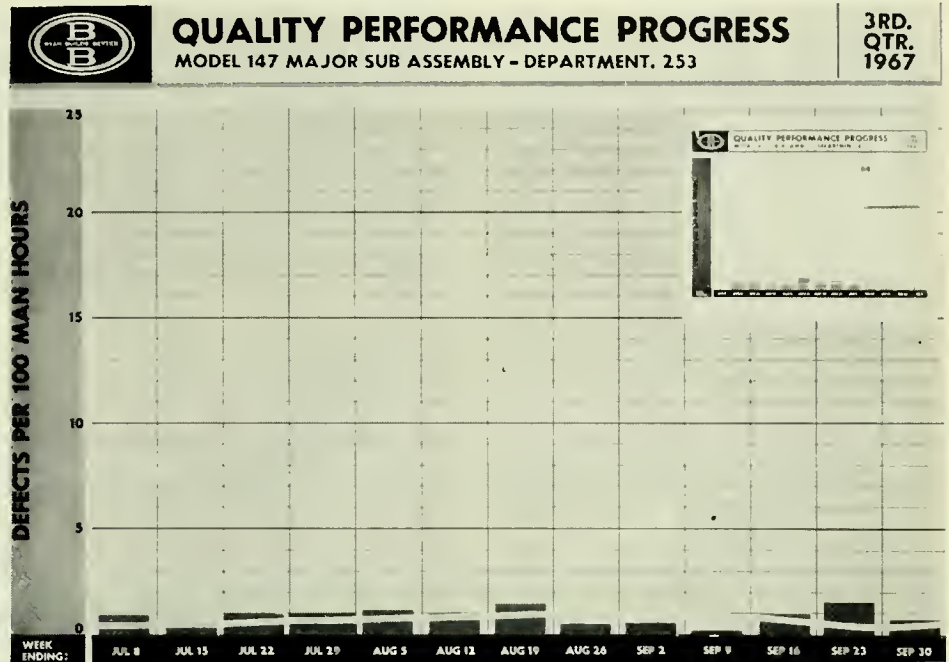
But when a department maintains, month after month, virtually the same minimum volume of errors, the potential for improvement is limited. In that category, for example, are Departments 253 and 256, which perform major subassembly and final assembly, respectively, on an advanced target drone.

"Both departments started off with very few defects, and held that high quality performance," Ken Hawkins, Manager of Assembly, explained.

The results have been noted by the Air Force, which has sent to J. R. Reichardt, Manager, Special Projects, a steady stream of "no discrepancies" notices on delivery

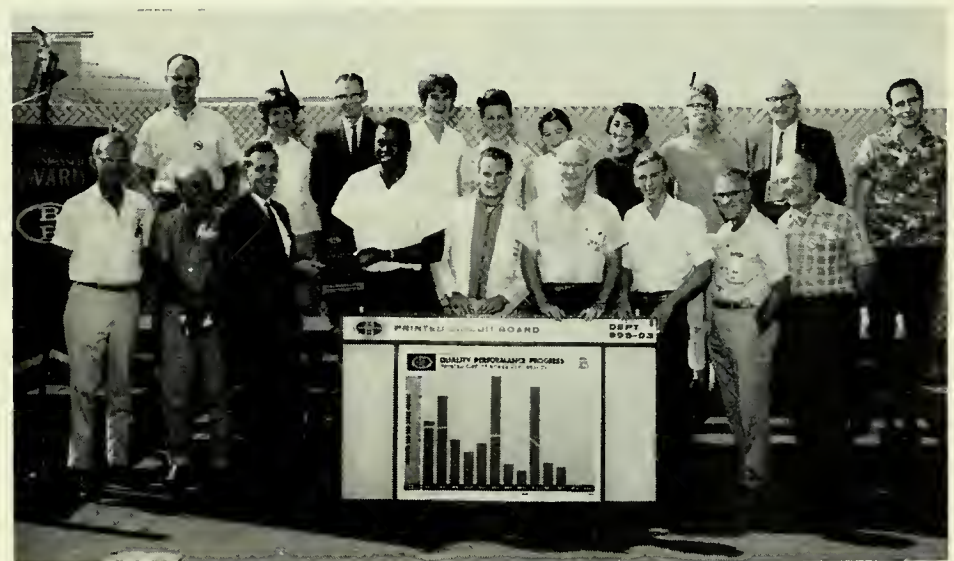
(Continued on Page 4)

Consistent Near-Zero Defects Performance Depicted



CONSISTENTLY LOW LEVEL OF DEFECTS over long period of time is depicted in Department 253's Quality Performance Progress Chart. Similar achievement has been recorded by Department 256. The two departments perform major subassembly and final assembly, respectively, on an advanced target drone.

Dept. 895-03 Wins Monthly "BB" Award First Time



FIRST TIME WINNER of Ryan "Builds Better" monthly award is Department 895-03, Printed Circuit Board, Electronic and Space Systems plant. Bob Dorsch, Manufacturing Superintendent, presents "BB" plaque for September to Bennie C. Anthony on behalf of department employees. New General Foreman of department is Louis Kruse, second from right, top row, who recently joined Ryan after service in a supervisory capacity at General Dynamics Convair. Department 895-03 was recently created as an offshoot of Department 895, Model Shop, in separation of functions. Department 895-01-02, which now concentrates on sheet metal and machine shop work, won a "Builds Better" award last August.

Views "BB" Program



HEAD OF "ZERO DEFECTS" PROGRAM at Continental Aviation and Engineering Corp., Toledo, O., subsidiary of Ryan's majority-owned Continental Motors Corp., Roger Poirier, at left, conferred at Ryan recently with Jack Salley, Ryan "Builds Better" program assistant. He also received pointers on quality assurance activities in tour through the Kearny Mesa and Electronic and Space Systems plants with Bill Walker of Quality Control. Coincidentally, Jerry Ryan, "Builds Better" program coordinator at Ryan, was on an official visit to the Continental plant in Muskegon, Mich. at the same time.

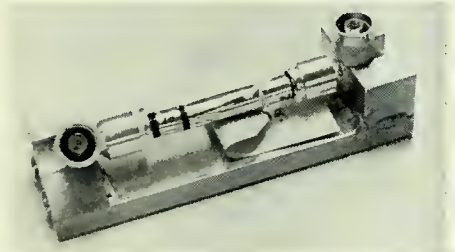
TEAMWORK LEADS TO BETTER METHODS

Teamwork of personnel in Department 822-02, Electrical Harness Assembly, Kearny Mesa plant, is evidenced by constant mutual "brainstorming" to improve quality and increase quantity.

A flow of suggestions resulting from such exchange of ideas has led to creation of new tools and techniques that have

saved substantial production manhours, enhanced efficiency and assured a declining level of defects.

Among most recent improvements proposed by employees and implemented by the area Industrial Engineer for action is a better method of feeding material into a Ryan-designed vinyl punch machine. Ken White, maintenance mechanic, made the proposal and incorporated the new feed



FIXTURE to hold coaxial assembly in place while connector nuts are tightened is pictured above.



BETTER WAY to feed material into vinyl punch machine was designed by Ken White, maintenance mechanic.

Time Saved By "Builds Better" Improvements



CONSIDERABLE SAVINGS IN MANHOURS are achieved by suggested "Builds Better" improvements in Department 822-02, Electrical Harness Assembly, Kearny Mesa plant. Utilizing special fixture, shown at right foreground, are left to right, Thomas Franklin; J. Loren Taber, of Quality Assurance; and Norma Hampton.

mechanism into the machine, with resultant considerable reduction in production time required.

Other employees suggested a fixture to hold the coaxial assembly in place while the connector nuts were tightened. The fixture was built, and is now in use, providing further time savings, according to S. G. Zimmermann, Industrial Engineer.

Low Defects Level

(Continued from Page 3)

of each unit.

"All personnel involved in these projects can take pride in our growing record of 'no discrepancies' type deliveries," Reichardt said. "Congratulations are in order."

RYAN AERONAUTICAL COMPANY

P.O. Box 311
San Diego, California 92112

RYAN BUILDS BETTER WITH ZERO DEFECTS

BULK RATE
U. S. POSTAGE
PAID
SAN DIEGO, CALIF.
Permit No. 437

Return Requested